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Szerkesztők • Edited by

Zsolt Mester

Attila Király

György Lengyel

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REVIEW ARTICLE

Lithic Research Roundtable 15, 2025

Edited by Csaba Bálint[a] & Attila Király[b]

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Abstract. The 15th annual meeting of Hungarian lithic specialists was held on December 5, 2025, at the István Dobó Castle Museum, Eger, organized by Csaba Bálint. The abstracts of the presentations and posters are as follows.

Keywords: Lithic Research Roundtable, conference, Palaeolithic, Mesolithic, Neolithic

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Use of pebble raw material during the Upper Palaeolithic in Hungary – 33 years later

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The exploitation of pebble outcrops as raw material sources had several advantages during Prehistory. First, during the fluvial transport or abrasion near marine or lake shores, the inhomogenities of the raw rocks were removed by rolling and sediment transport, so the outcrops are enriched with relatively high-quality specimens. Secondly, the pieces of optimal dimensions and shapes for lithic tool manufacture could have been easily collected from the loose sediments, and, finally, in some cases, various raw material types, including coarse-grained quartzite and fine siliceous rocks, could have been available from single outcrops or geological formations.

In 1992, Viola Dobosi, during the first evaluation of the Mogyorósbánya lithic assemblage, in addition to the old-known Ságvár lithics, extended the classification of the Upper Palaeolithic Ságvárian or Pebble Gravettian entity, dated to the last cold peak of the last glaciation (LGM). In the presentation, we review some technological traits of the lithic collections excavated at Szob in the Danube bend, Mogyorósbánya and Madras lying in the southernmost part of the Great Plain (Alföld).

As a result, two main methods were identified: blade and bladelet reduction based on single-platform cores and bladelet production of burin cores shaped basically on cortical flakes. The 'archaic elements' (pebble slices and segments, naturally backed knives as well as geometrically broken pebble types), emphasised earlier, are characteristic by-products of the special bladelet production based on raw material types collected from secondary raw material sources.

The Hungarian Middle Palaeolithic in a broad perspective

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The Middle Danube valley represents one of the main contact areas of Europe. Its role is widely known in the dispersal of modern humans and the neolithisation of Europe. Concerning this role, no data were available for the older periods of the Palaeolithic. In his synthesis of the Middle Palaeolithic, published in 1976, Miklós Gábori have drawn the contacts of the Middle Palaeolithic industries of Hungary from western directions. In his big monograph in 2004, using larger cultural regions, Janusz K. Kozłowski have linked them with the industries of neighbouring territories in northern and southern directions too. These models are worth reviewing in light of the research conducted during the last two decades. The Central European relations of the Taubachian and the Micoquian seem to be continued. The eastern and southeastern relations of the bifacial leafpoints industries are questionable. Several possibilities arise for the interpretation of the relations of the Mousterian industries, which are worth studying in detail.

Gábori, M. (1976). *Les civilisations du Paléolithique moyen entre les Alpes et l'Oural*. Budapest: Akadémiai Kiadó

Kozłowski, J. K. (2004). *Świat przed "revolucja" neolityczną*. Kraków: Fogra Oficyna Wydawnica (Wielka Historia Świata tom 1)

Közép-bérc (KÖH 51080) – Open-air Middle Palaeolithic site in the Gyöngyöspata Basin

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In the administrative area of Gyöngyöspata, László Tóth, an agronomist from Pásztó, identified a considerable number of archaeological sites in the mid-1980s. Most of these sites have yielded valuable lithic assemblages which, from both a technological and typological perspective, can be attributed to the Middle Palaeolithic. The majority can be compared only with a few sites in the area of the nearby Szurdokpüspöki and with the side-scraper-rich Mousterian industries of the Bükk Mountains. Another possible parallel is the Micoquian industry, whose nearest occurrence lies in the territory of the neighbouring Gyöngyöstarján. The presentation provides, in an overview form, a description of the Middle Palaeolithic site situated at "Közép-bérc", located at the western end of Gyöngyöspata, directly on the north-eastern bank of the Száraz-patak-völgy stream Valley. The toolkit is dominated by standard Mousterian tools. A peculiarity of the lithic material is the presence of the Levallois concept expressed in the form of cores, as well as a bifacial knife ("Keilmesser") preform. These finds raise the question of the relationship between the Mousterian industry, the Levallois concept, and the industry containing Micoquian elements. It should also be noted that traces of the Levallois concept have been identified at several other sites within the Gyöngyöspata Basin. However, far-reaching conclusions cannot be drawn on the basis of surface-collected artefacts alone. A similar duality is characteristic of many significant cave and open-air sites across Central Europe, particularly in Germany (Salzgitter-Lebenstedt, Königsaue, Sesselfelsgrotte) and southern Poland (the Biśnik and Ciemna cave sites). To clarify both the cultural context of the assemblage and its stratigraphic position, a test excavation is strongly recommended at the "Közép-bérc" site.

Shelter? Dwelling? Burial site? – New Results from the Kő-lyuk I Project

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The Kő-lyuk I Cave at Parasznya, researched since 1913, offers an exceptional opportunity to collect scientific information without stratigraphic interruption from the present day back to the end of the Middle Pleistocene by exploring its large area of untouched sediments. The research, prepared by the Herman Ottó Museum in 2010–2011 and launched in 2021, aims primarily to interpret the evidence and archaeological heritage of known (or presumed) prehistoric and Palaeolithic human presence in the context of the cave's developmental history, striving for a complex, ecological approach in the excavation.

Based on the more than 1,300 archaeological and palaeontological finds uncovered so far, along with stratigraphic observations and absolute dating, we have been able to distinguish four time horizons: the Late Bronze Age (Kyjatice culture), the Middle Neolithic (Bükk Linear Pottery culture), the introductory phase of the Holocene (Preboreal), and the Early Upper Palaeolithic (39–32 ky BP).

The most recent and noteworthy results of the excavations carried out in 2024–2025 include the identification and excavation of two prehistoric burials, as well as the dating and material analysis of a large Neolithic fireplace. The incompletely preserved, partially anatomically connected skeletal burial can be linked to a child aged around 6–7 who lived in the Middle Neolithic. The Late Bronze Age stone-cairn urn burial was found to be heavily disturbed and looted.

According to on-site stratigraphic observations and associated laboratory analyses, it is highly probable that the cave was uninhabitable during the Preboreal–Atlantic phases due to flooding. The current research results suggest that the previously assumed function of the cave should be reconsidered, especially in relation to the Neolithic and Bronze Ages.

Leave no stone unturned: studying spatial patterns in Neolithic sites

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Stone tools made of various raw materials are characteristic components of Neolithic assemblages. Knapped and polished implements, grinding stones and other toolstones served as multifunctional tools in the toolkit of former households. Different aspects of these artefacts were studied from their raw materials through production techniques to use-wear analysis. However, the contextual approach, considered to be an important part of archaeological investigation, is often neglected in studies mainly carried out by geologists and other specialists. Here we present the assemblages of four settlements from different Neolithic periods. The sites included in the analysis differ not only in their dating, but their types of assemblages and the methods used during the excavations, which also influence analysis and interpretation. The speed of recovery required by mining operations in the almost completely excavated Middle Neolithic settlement of Bükkábrány-Bánya VII stands in stark contrast with the pace of planned excavations in Öcsöd-Kováshalom and Hódmezővásárhely-Kökénydomb, optimised for scientific study. The former site, however, rivals the late Neolithic Polgár-Csőszhalom site in terms of sampling coverage (the number of excavated features), which offers an opportunity for other types of analyses. The presentation aims to test the limits of interpretation, in addition to outlining the possible directions of contextual and spatial analyses, and to present the feasibility of such research with the help of more detailed studies on some assemblages.

Introduction of the Atlas of Prehistoric Polished Stone Tool Raw Materials in Hungary

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The Atlas of Prehistoric Polished Stone Tool Raw Materials in Hungary was prepared with the support of the ITM NKFI Fund, within the framework of project number K-131814. In our presentation, we present a summary work considered as the most important result of the completed research project. The Atlas is based on a continuously developing database, called “kigyla”, containing both archaeological and geological items (https://kigyla.hp-soft.hu/#/home, T. Biró et al. 2021). The compilation is a result of the detailed examination of several thousand archaeological polished stone tools and nearly a hundred geological samples. It contains the rock types occurring as (typical) polished stone tool raw materials in the prehistoric finds of Hungary, and provides a comprehensive interpretation.

The discussion is mostly according to a classical petrological classification, partly based on their frequency in the archaeological record. The petrological classification system of the Atlas – established by György Szakmány (2009) – begins with the most common rock type in the Hungarian assemblages, the contact metabasite (metamorphic rock, more precisely amphibole-rich metabasite). In the following, other amphibole-rich metabasite rock types, then other metamorphites, in order of frequency, are mentioned. The contact metabasites are followed by basalt in importance (belonging to the basic-ultrabasic group of igneous rocks), after which the other basic-ultrabasic, and then the neutral-acidic magmatites are described. At the end of the system, the regionally significant ‘whitestone’ is presented, which can partly be classified as sedimentary rock. Although we mention other, less common rock types for all three major rock groups in the classification system, the Atlas does not include a detailed discussion of those.

This Atlas could not have been created without the dedicated work of many researchers, whose published results are cited as cited articles, while their unpublished results are referenced as manuscripts (BSc, MSc, PhD theses, research reports). The provenance research of polished stone tools would not have been possible without the initial questions, interest and provision of finds by the archaeologists. In addition, we would like to thank many institutions for the care of the collections containing the finds and for the provision of the archaeological objects.

Bogács-Vén-hegy – A Multi-period Open-air Archaeological Site in the Bükkalja Region

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We began systematic field surveys in the Hór Valley area in the autumn of 2016. These investigations aimed to identify open-air occurrences of Mousterian industries comparable to those recovered from the nearby Suba-lyuk Cave. The surveys proved successful almost immediately. In addition to several smaller occupation spots, the sites of Szomolya–Gyűrdemecs and Bogács–Vén-hegy—the focus of the presentation—were discovered. Continuous surface collection has been carried out at these sites, and more recently, research has also been extended to the area around Tard. At Bogács–Vén-hegy, artefacts have been recorded with a handheld GPS device since 2017. Based on these data, artefacts were recovered across an area measuring roughly 500 m by 120 m. The site is currently under arable cultivation. Among the several thousand finds recovered so far, nearly one thousand are stone tools. The Middle Palaeolithic assemblage is represented by two Mousterian facies—the "Typical Mousterian" and the "Quina Mousterian"—both also observed in the Suba-lyuk Cave. The transitional phase between the Middle and Upper Palaeolithic is characterised by bifacial and leaf-point industries, whereas the Early Upper Palaeolithic is primarily represented by Aurignacian facies, including the Proto-Aurignacian. Traces of later prehistoric activity, mainly associated with the "Alföld Linear Pottery Culture", are also present at the site. The raw material of the knapped stone artefacts is highly varied. Most of the materials could have been obtained within a radius of about 30 km from the site. During the different periods of occupation, the preferred raw material—limnic silicite—was brought from the nearby area of Kács. The raw material source, located roughly 8 km from the site as the crow flies, was first described by the geologist Zoltán Schréter in 1916 and was successfully re-identified in 2017. Other commonly occurring raw materials include metarhyolite, Bükk radiolarite, radiolarian siliceous shale, obsidian, and Egerbakta–Felnémet orthoquartzite. In this presentation, we intend to outline the preliminary results of our research.

Research in the Szeleta Cave

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The Szeleta Cave is one of the sites of Palaeolithic research in Hungary, from which we know hardly any details regarding the exact chronology of the archaeological layers. Despite more than a century of research, there are still many unanswered questions surrounding the history of human settlement in the cave. In 2024, we launched a new research project to clarify the relative and absolute chronology. Although the research is made more difficult by the currently partly available strata, the preliminary results already provide answers regarding the transitional period between the Middle and Upper Palaeolithic. Thus, we can divide the strata of the cave more precisely than before, both in terms of sedimentology and archaeology.

Reassessing the upper cultural layer of Jászfelsőszentgyörgy-Szúnyogos

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Jászfelsőszentgyörgy–Szúnyogos is one of the few excavated Palaeolithic sites on the Great Hungarian Plain, and it holds particular significance for the study of the region's Late Upper Palaeolithic. Archaeological finds from the site were partly collected from the surface and partly identified in two separate archaeological layers during excavations carried out by Viola T. Dobosi in the 1990s. She attributed the lower layer to the earlier phase of the Epigravettian and linked it to the 'Laugerie' interstadial, while the upper layer was assigned to a younger phase of the same culture, presumably corresponding to the 'Lascaux' interstadial. From the late 1990s onwards, however, the possibility has repeatedly been raised that the upper layer should rather be classified as 'Epipalaeolithic'. In this interpretation, it would represent a transitional phase between the Late Upper Palaeolithic and the Mesolithic within the Jászság region, alongside other archaeological sites.

To reassess the cultural and chronological position of the upper layer, we present the lithic assemblage, the faunal remains, and the stratigraphic sequence known from the original documentation, supplemented by the results of our 2024 field survey and new radiocarbon dating. Our results reliably date the site to Greenland Stadial-2.1 and attribute it culturally to the Late Epigravettian of eastern Central Europe, with no compelling evidence supporting an 'Epipalaeolithic' attribution. Rather than representing the survival of Epigravettian hunter-gatherers into a transitional phase in the Carpathian Basin, the lithic assemblage shows no technological or typological links to the Mesolithic, confirming the observations originally made by Viola T. Dobosi.

Late Mesolithic in Southern Transdanubia: new aspects for the evaluation of the Kaposhomok find assemblages

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During archaeological field investigations conducted in the 1950s on a sand dune situated within the Kapos River floodplain, near the boundary of Kaposhomok, a lithic assemblage comprising chipped stone artefacts was recovered. On typological grounds, the assemblage was initially attributed to the Mesolithic period. This attribution holds particular significance, as no evidence of other prehistoric cultures utilising chipped stone technology was identified at the site.

Subsequent re-evaluation of the assemblage corroborated the Mesolithic classification, further refining the chronology to the Late Mesolithic based on the presence of geometric microliths. The original collection has since been augmented with additional chipped stone artefacts, prompting a comprehensive reassessment in light of comparative material from analogous sites located in the Kapos and Koppány river valleys.

All lithic artefacts were manufactured from radiolarite, sourced from the Bakony and Mecsek mountain regions. The typological spectrum includes trapezes, an asymmetrical triangle form, a Sauveterrian-like point, and Montbani-type blades characterised by multiple notches. These tool types exhibit close parallels with the so-called "paracastelnovian" lithic industries of the Western Balkans, suggesting the existence of southward-oriented contact networks during the Late Mesolithic.

New research at the Middle Palaeolithic Galgagyörk-Csonkás-hegy site (poster)

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In the Galga Valley, it became known in the 1990s that Paleolithic sites can be found on the hill ranges along both banks of the river. The research was first initiated by Éva Cs. Balogh and Viola T. Dobosi. Systematic field surveys were later carried out by independent researcher Attila Péntek. As a result, numerous Middle and Upper Paleolithic sites and stone tool raw material sources were identified.

The high density of Ice Age sites can be attributed to the wide river valley, rich in water and pasture, which provided a natural passage from the Zagyva to the Becske area. In addition to the migration of prey animals, the availability of stone tool raw materials (limnosilicite, andesite, flint and quartzite pebbles) was also a determining factor for the ancient hunters.

The Csonkás-hegy site was localized by Attila Péntek in 2001. Sondage sampling was carried out in 2008 and 2018 under the leadership of András Markó. At that time, a lithic industry rich in sidescrapers, relying on local limnosilicite and long-distance metaryolite as well as local andesite of less good quality, was excavated.

This year, another small salvage excavation was conducted, as a service road was built right next to the site. During the investigations, the site was delimited in the direction of the main valley and the valley-centre ridge. In the same stratigraphic position, about 70 metres from the previous sondages, the industry, rich in sidescrapers using the same local raw material, was again discovered. In order to get to know the site more precisely, Dr. Erzsébet Horváth (ELTE-TTK) took new sedimentological and OSL samples to clarify the chronological and environmental interpretation of the site.

The Csonkás-hegy site has thus become one of the key loci of Paleolithic research in the Galga Valley.

Archaeometric investigations on the polished stone tool assemblage of the Late Neolithic Öcsöd-Kováshalom site (poster)

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A total of 193 polished stone tools were excavated between 1980 and 1985 at the Late Neolithic (Tisza culture, turn of the 6th–5th millennium BC, Middle Tisza region) tell-like settlement of Öcsöd-Kováshalom. Our research aimed to identify the raw materials and the provenance of the finds by petrographic and analytical methods (OM, MS, SEM-EDS, PGAA).

The assemblage consists of highly fragmented stone tools, predominantly without perforation (chisels, axes, shoe-last axes), which can be classified into 10 major petrographic types and other lithologies occurring as individual samples. The predominant rock type (40%) is metadolerite-metamicrogabbro, which forms a unified group in terms of its macro- and microscopic petrographic characteristics (colour, texture, mineralogical composition), although MS values fall into three ranges (low, medium, high). The tools may presumably originate from several raw material sources (Szarvaskő, Mureș Valley, possibly the Dinaric-Vardar zone, Szilágyi et al. 2022). Greenschist–amphibolite is the second most common type (16%), representing a petrographically heterogeneous group (grain size, texture, mineral composition) without an exact origin (possibly Western Carpathians) due to its regional distribution and common formation processes (Szakmány et al. 2018). Contact metabasite and hornfels (11–11% each) are rock types that can be macroscopically identified with high confidence and are common polished stone tool raw materials, characterised by a relatively unified tool form. The metabasites derive from the Krkonoše Jizera Crystalline Complex in the Czech Republic, while the hornfels originates from the Rusca Mts. or the southern part of the Apuseni Mts. Subordinate rock types include acidic–neutral metamagmatite, andesite, basalt, limestone, and sandstone. Among the individual stone tools, quartzite/quartzite schist, skarn, serpentinite, chloritite, nephrite, marble, and metamonzodiorite occur.

Our study confirms the use of both eastern (Apuseni Mts) and northern (Western Carpathians) regional, and long-distance (Krkonoše Jizera Crystalline Complex) raw material supply at Öcsöd-Kováshalom. This diverse polished stone tool assemblage indicates a complex system of relationships in the Middle Tisza region of the Great Hungarian Plain, which lacks primary outcrops and is poor in alluvial gravel.

Kup-Egyes: processing workshop of Tevel flint (poster)

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The prehistoric settlement Kup-Egyes is located near the city of Pápa, N-Central Transdanubia. It was located in 1974. Sándor Mithay, archaeologist, director of the Pápa Municipal Museum (later: Esterházy Károly Castle Museum), used to perform authenticating excavations on the site where he found settlement traces of the Linearbandkeramik and the Lengyel culture. On the initiative of the inhabitants of the municipality, new excavations were performed here between 2000-2003, in collaboration with the Hungarian National Museum and the Laczkó Dezső Múzeum, Veszprém. The pottery is dominated by the Late Neolithic - Early Copper Age Lengyel culture ceramic, apart from which an abundant quantity of LBK sherds were also found. As a new element in the occupation of the settlement, Middle/Late Copper Age finds associated with the Proto-Boleráz culture were also located. The settlement was excavated by manual methods; the excavation features – pits, ovens, house debris – could be mainly associated with the Lengyel culture. Within the finds, lithic artefacts have an outstanding role, primarily in the chipped stone industry, the procurement and processing of the dominating Upper Cretaceous Tevel flint used to represent an important element in the life of the community. Considerable quantities of animal bone were also found on the site; the exceptional specimens (aurochs, bull and dog skull) were probably related to building offerings. The poster will present the lithic material of the site, its typological and raw material composition. The complete publication of the results of the 2000-2003 excavations will be realised in the 2025 volume of *Communicationes Archæologicæ Hungariæ*.

Archaeometric investigation of Late Bronze Age macrolithic finds of metamorphic origin from Csanádpalota –Földvár, SE-Hungary (poster)

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In the last decades a system of large Late Bronze Age fortified settlements was identified in SE-Hungary (Szeverényi et al 2015, Szeverényi et al 2022). The largest fortified settlement of this system is Csanádpalota – Földvár (cca. 460 hectares). In the first excavation period (2011-2013) of the megasite more than 100 features were excavated which dated to the Pre-Gáva (Cruceni–Belegis II) period (middle phase of the Late Bronze Age, cca. 1350–1100 BC). These contained 238 mostly fragmented macrolithic artefacts. A set of archaeological (Priskin, 2022) and petrological (Péterdi et al., 2024, 2025) analyses have already been carried out on this macrolithic material. The artefacts are made of sandstone (42%), quartzite-quartz rich sandstone (15%), micaceous metamorphic rocks (16%), volcanic rocks (14%), granite (5%), limestone (4%) and other materials, e.g. daub (9%). So far only the andesite (Péterdi et al., 2024) and the alkaline basalt (Péterdi et al., 2025) raw materials were studied in detail with petrographic and geochemical/mineral-chemical methods. In this poster we are presenting the preliminary results of our detailed petrographic and mineral-chemical investigations of the basic metamorphic raw materials. We will also try to give a rough estimation of the origin of these raw materials. The project has received funding from the Hungarian National Fund (NKA, Grant Nr. 3234/230, Nr. 207134/306 and Nr. 207134/00383), National Research, Development and Innovation Office (OTKA-FK 135805, and OTKA-K-131814, ADVANCED Research Grant Nr. 150223), and the Wenner-Gren Foundation (Dissertation Fieldwork Grant Nr. 9472).

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LITIKUM

RESEARCH ARTICLE

Gyöngyöspata-Felső-Eresztvény, a Middle Palaeolithic open-air site complex (western Mátra Mountains, Northern Hungary) – preliminary results

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Abstract. The Felső-Eresztvény site complex was identified in January 2025 on a ridge north of Gyöngyöspata in the Western Mátra Mountains. Systematic field surveys documented a 13.9-hectare open-air Middle Palaeolithic locality with a predominantly limnosilicite assemblage. The lithics are technologically homogeneous and characterised mainly by Mousterian notched tools and side-scraper types with a non-significant sub-laminar component. Elements of the Upper Palaeolithic and Later Prehistoric periods are very scarce or absent. An exhausted recurrent centripetal core indicates the limited presence of the Levallois concept within a flake-based Mousterian industry. Variation in patination and rolling suggests multiple occupation episodes. These results position Felső-Eresztvény as one of the most extensive and informative Middle Palaeolithic surface assemblages in the Gyöngyöspata Basin.

Keywords: western Mátra Mountains, Gyöngyöspata Basin, Middle Palaeolithic, Mousterian industry, Levallois concept, limnosilicite

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1 Introduction

The Gyöngyöspata Basin represents one of the most significant, yet still insufficiently documented, Middle Palaeolithic micro-regional units of the Western Mátra Mountains. From the 1980s onwards, several sites became known in the area, and in the 2000s, further lithic concentrations and low-density open-air localities were identified. Nevertheless, the structure, technological variability and spatial patterning of Middle Palaeolithic activity in the basin remain only fragmentarily understood.

Beginning in January 2025, a large Palaeolithic site complex was identified on a ridge currently under viticulture in the northern part of Gyöngyöspata (Felső-Eresztvény). The surface assemblage of the approximately 13.9-hectare area showed a technologically homogeneous, predominantly limnosilicite-based Middle Palaeolithic, Mousterian character already during the initial field surveys. A few elements suggesting the application of the Levallois concept are also present in the assemblage. Given its extent and the typological variability of the assemblage, the site complex represents a significant new data source for Middle Palaeolithic research along the southern margin of the Mátra Mountains.

The present paper aims to provide the first comprehensive presentation of the Felső-Eresztvény site complex and to contextualise its assemblage within the framework of the Gyöngyöspata Basin and the Middle Palaeolithic industries of northern Hungary. The study briefly reviews the research history of the site's surroundings, as well as its geographical and geological setting. It then describes the knapped stone assemblage. On the basis of taphonomic

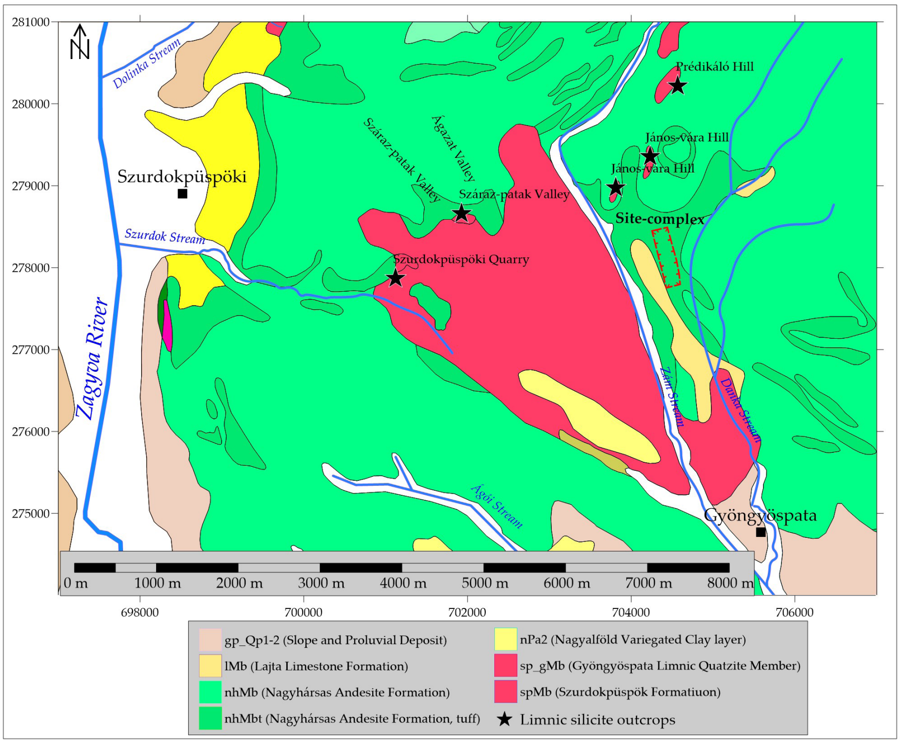


Fig. 1. Geological map of the Gyöngyöspata Basin. Basemap: SZTFH (Szabályozott Tevékenységek Felügyeleti Hatósága) térképek - Magyarország földtani alapszelvényei 1: 100 000

variation, reduction strategies and regional parallels, an assessment of the assemblage is attempted. GIS-based spatial analyses were also conducted to evaluate the possible secondary displacement of finds and to characterise the function and nature of the site complex.

2 The site complex

2.1 The research history of the surroundings

The first significant phase of Palaeolithic research in the Gyöngyöspata Basin dates to the mid-1980s, when László Tóth, an agronomist from Pásztó, identified several surface sites in the area. The collected knapped stone material proved to be clearly of Middle Palaeolithic character in several cases, indicating that the basin preserves not merely scattered finds but potentially the traces of more extensive open-air activity (Péntek *et al.*, 2025).

Further surveys in 2005 by Mónika Gutay and Gyula Kerékgyártó in the southern part of the basin documented additional occurrences of limnosilicite artefacts around the Gyöngyöspata-Úrrá-tesz area. Gutay's (2007) thesis noted that although the artefacts were widely dispersed, surface processes and erosion had likely modified the original spatial patterning of prehistoric activity.

Subsequent field observations by archaeology student Ferenc Benus in 2012 led to the identification of another Middle Palaeolithic locality in the Gyöngyöspata-Mész-oldal area, further supporting the interpretation that the geomorphological conditions and raw material sources of the basin were favourable for Palaeolithic settlement. Repeated field surveys conducted by the authors since spring 2025 indicate that the site originally identified by Benus is considerably more extensive than initially recognised.

In November 2024, the author and colleagues identified the Közép-bérc site complex, a large locality of approximately 17 ha situated west of the Felső-Eresztvény site complex, on the southwestern side of the Zám (Ám) Stream.

The identification of the Felső-Eresztvény site complex in 2025 represents a significant new result in this research sequence. The extensive, technologically homogeneous assemblage, traceable over several hundred metres, is among the first localities in the Gyöngyöspata Basin where the spatial patterning of Middle Palaeolithic activity, raw material use and knapping can be examined in detail.

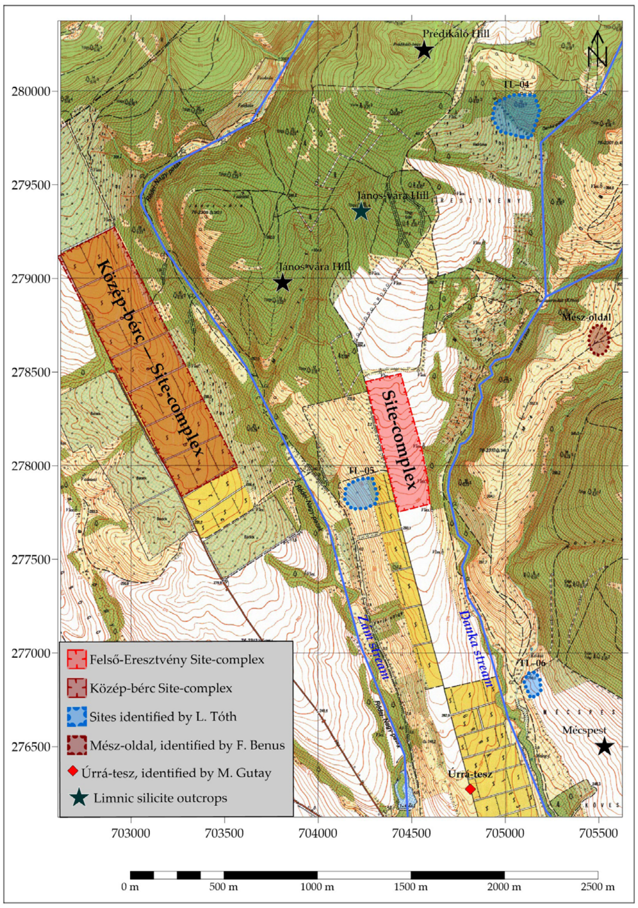


Fig. 2. Archaeological sites and raw material outcrops in the vicinity of the site complex. Map: Attila Péntek

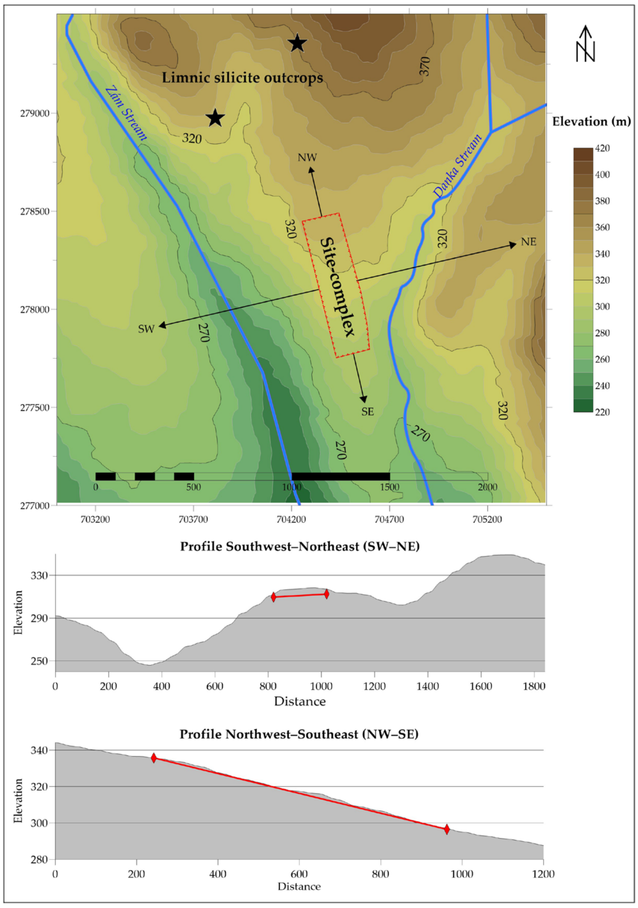


Fig. 3. The position of the site complex on the hillcrest. Map: Attila Péntek

2.2 Geographical and geological environment

The site complex is situated in the northwestern part of the Gyöngyöspata Basin, on a north-northwest–south-southeast oriented ridge running between the Zám and Danka streams. The area can be regarded as the northwestern continuation of the Gyöngyöspata-Úrrá-tesz field boundary area. The ridge is flanked both to the west and to the east – beyond the Danka Stream – by pyroxene andesite tuff, agglomerate and breccia belonging to the Nagyhársas Andesite Formation; andesite also occurs as surface outcrops at several locations (Fig. 1).

At some locations along the ridge, particularly on the right bank of the Zám Stream, limnosilicite-bearing diatomite, limestone and occasionally a post-volcanic, silica-rich raw material outcrop. Following Přichystal (2010) and Mester & Faragó (2016), we refer to the latter as limnosilicite. The silica-rich hydrothermal springs associated with the region's post-volcanic hydrothermal activity produced geyserite and limnosilicite precipitates in the surrounding basins. These formations form part of the Gyöngyöspata Limnic Quartzite Member, with characteristic outcrops known from the János-vára and Prédikáló-tető localities (Schréter, 1950; Varga *et al.*, 1975; Dövényi, 2010; Mester & Faragó, 2022).

The local limnosilicite is fine-grained and homogeneous in structure, contains few inclusions, and possesses excellent knapping properties. These characteristics likely played a determining role in the development of the Middle Palaeolithic knapping activities documented in the Gyöngyöspata Basin.

2.3 Topographic data

Fig. 2 shows the previously known archaeological sites in the vicinity of the site complex. At the Gyöngyöspata 05 site, located on the southwestern slope of the ridge, Tóth collected a small quantity of prehistoric material containing Late Bronze Age (Kyjatice culture) pottery. The find circumstances suggest a secondary,

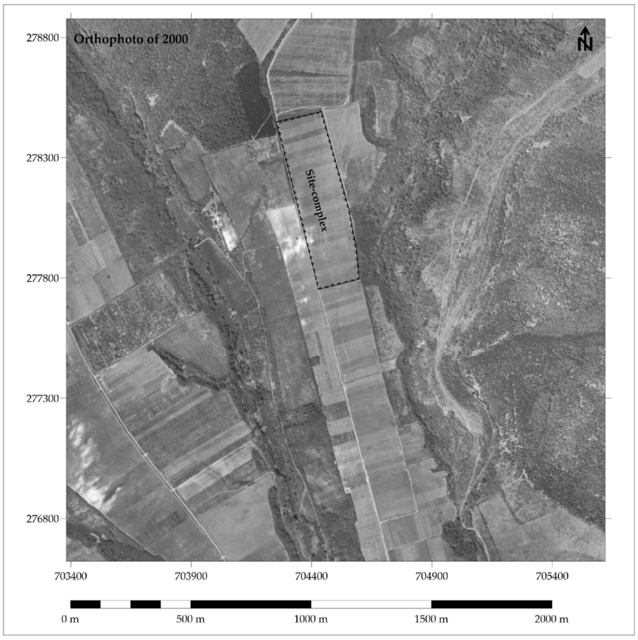


Fig. 4. Ortophoto of the surroundings taken in 2000. "Orthophoto of Hungary – 2000." Digital Orthophoto Database. Source: Lechner Tudásközpont / FÖMI, Budapest.

downslope-displaced position. The figure also indicates the Gyöngyöspata-Mész-oldal Middle Palaeolithic site discovered by Benus in 2012, as well as the principal limnosilicite raw material outcrops in the Gyöngyöspata Basin.

The currently known length of the site complex is 715–720 m, its width is typically 190–200 m, narrowing to 170 m at the south-southeastern end. Its total area is 13.94 ha. The elevation of the ridge ranges between 298.0 and 334.7 m above sea level; the longitudinal slope is relatively pronounced at 5.14% ("Sloping", Reinhold *et al.*, 2006, p. 12, Table 7). The surface is relatively even in the transverse direction, with an elevation difference of only 4 m between the western and eastern margins. The relative height towards the Zám Stream valley to the west is 60–80 m, while towards the Danka Stream to the east it is only 15–25 m (Fig. 3).

2.4 The lithic material

The total assemblage comprises 601 lithic artefacts, documented by the author through systematic surface collections. The spatial position of the finds was recorded using a handheld GPS device. Of these, 326 finds were recovered from Collection Zone 1 (CZ1) and 110 from Collection Zone 2 (CZ2). A further 31 finds were recorded in the 1.72-hectare poorly collectable area adjoining the southeastern margin of CZ1. These stray finds, which cannot be confidently assigned to the concentration, are not discussed in detail. Similarly, the 44 documented finds from the 5.73-hectare area at the southeastern end of the site complex are not described individually, as their asymmetric, non-concentrated scatter would introduce distortion into the analysis. Since they are, however, technologically and typologically as homogeneous as the assemblage from the two main concentrations, they are included in the overall description.

The surface distribution of finds is closely related to the intensive agricultural use of the area. Archive data and an orthophotography from 2000 (Fig. 4) allow the transition from crop cultivation to viticulture to be identified. The Palaeolithic contexts were most likely disturbed most significantly by deep ploughing before vineyard establishment, which brought large quantities of finds to the surface. The northern-northwestern section of the current find concentration – approximately 420 m long and 202 m wide (ca. 8.18 ha) – presents an uneven picture, partly due to parcels withdrawn from cultivation and overgrown with vegetation, and partly due to the natural limnosilicite surface cover. The upper CZ1 covers 2.23 ha, and the lower CZ2 covers 3.52 ha. The area between the two collection zones is partly poorly collectable and partly uncollectable. Despite the factors hampering collection, the assemblage from the entire area of the site complex forms a technologically coherent unit.

The artefact distribution across the entire site complex is shown in Fig. 5, and a heatmap of the artefact-rich northwestern area is presented in Fig. 6. Both figures indicate the poorly collectable (light grey) and uncollectable (medium grey) zones of the site complex.

3 Methods

3.1 Classification of lithic implements

The composition of the total 601-piece assemblage is presented in Table 1, and that of the individual collection zones in Table 2.

Finds were assigned to five categories based on their role within the reduction sequence (*chaîne opératoire*):

Tools: Typologically identifiable retouched implements. This category also includes diverse

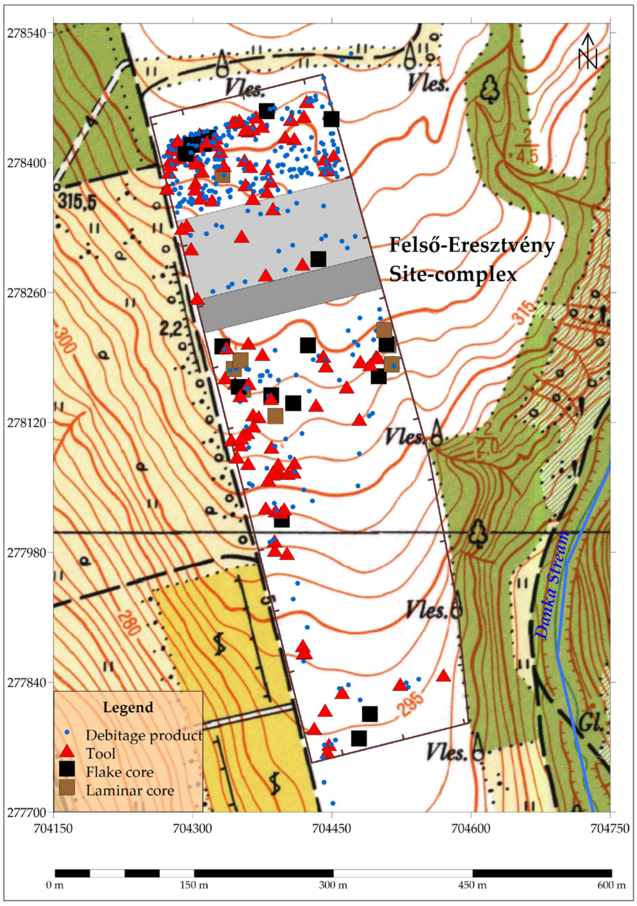


Fig. 5. The artefact distribution across the entire site complex. Map: Attila Péntek

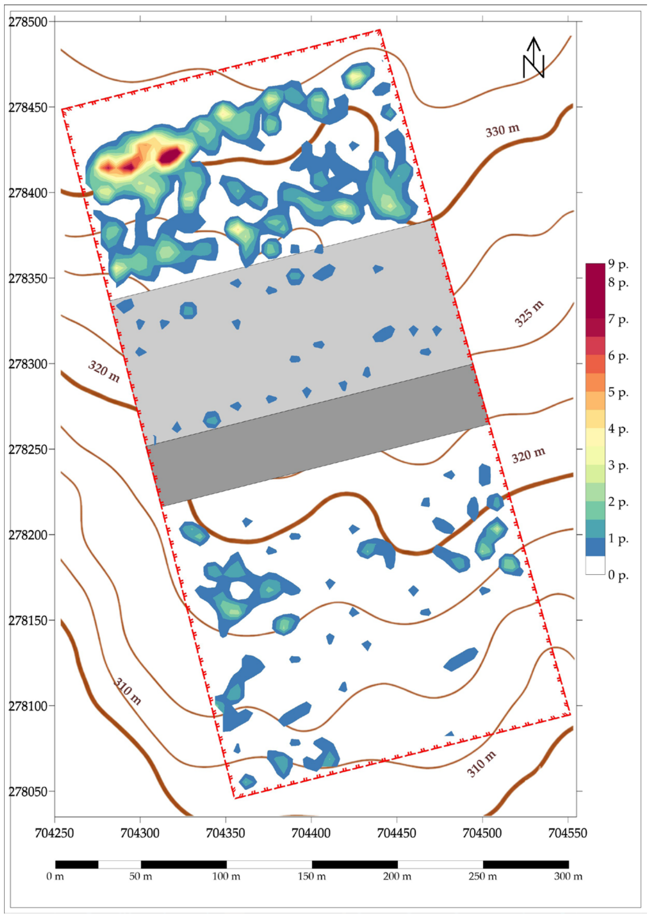


Fig. 6. Heatmap of the artefact-rich northwestern area of he site complex. Map: Attila Péntek

(indeterminate) tools which, due to heavy weathering or rolling, cannot be assigned to a typological category but bear traces of anthropogenic modification (114 pieces, 18.97% of the assemblage).

Debitage products: Following Inizan *et al.* (1999, p. 138), this term refers to all removals resulting from the knapping of a core. In the present study, however, debitage products are distinguished from waste products on morphological grounds: only flakes retaining a clearly identifiable butt and bulb of percussion are assigned to this category (245 pieces, 40.77% of the assemblage). The boundary between debitage products and waste products is inherently uncertain in surface assemblages, where platform attributes may be obscured by weathering or rolling; pieces in which platform preservation was ambiguous were therefore assigned to the waste product category.

Waste products: A functional rather than technological category, comprising all by-products– including cortical flakes, shatter and fragments lacking diagnostic platform attributes–that did not become tools or preforms (cf. Andrefsky, 2005) (210 pieces, 34.94% of the assemblage).

Cores: Blocks used for the production of knapped products, on which the negative scars from removal are clearly identifiable (26 pieces). Within this category, flake cores (18 pieces, 3.00% of the assemblage) and sub-laminar cores (8 pieces, 1.33% of the assemblage) were distinguished. The products detached from the latter include elongated pieces, flakes, and blade-like flakes that meet the length-to-width ratio criterion for blades but do not satisfy the strict blade criteria of regularity, parallel edges, and consistent dorsal ridges.

Pebbles: Six quartzite pieces belong to this category (1.24%), one of which was probably used as a hammerstone during knapping, based on the damage visible at its ends.

3.2 Spatial analyses

Table 1. Gyöngyöspata-Felső-Eresztvény, lithic implement counts and ratios.

	Limnosilicite	Andesite	Quartzite	Total	% of tools	% of total
End-scraper	4	-	-	4	3.51	-
Side scraper	14	-	1	15	13.16	-
Borer	1	-	-	1	0.88	-
Burin	2	-	-	2	1.75	-
Combined tool	1	-	-	1	0.88	-
Denticulated tool	4	-	-	4	3.51	-
Notched tool	15	-	1	16	14.04	-
Retouched flake	20	-	-	20	17.54	-
Retouched RMF	35	-	1	36	31.58	-
Diverse	14	-	1	15	13.16	-
Tools total	110	-	4	114	-	18.97
	-	-	-	-	-	-
Debitage	234	6	5	245	-	40.77
Waste product	198	-	12	210	-	34.94
Flake core	15	2	1	18	-	3.00
Laminar core	8	-	-	8	-	1.33
Pebble	-	-	6	6	-	1.00
Total	565	8	28	601	-	100.00
%	94.01	1.33	4.66	100.00	-	-

The geomorphological and spatial-statistical analysis aimed to determine whether the observed artefact distribution reflects post-depositional displacement caused by natural processes or primarily preserves the spatial patterning of human activity. The Standard Deviational Ellipse method, used as the primary statistical tool, characterises the shape, orientation and central tendency of the artefact distribution.

The analyses were performed in QGIS v3.40 LTR using Python 3.1.2 scripting. The database comprises GPS coordinates recorded during field surveys and a high-resolution digital elevation model of the study area (Copernicus DEM, 10 m resolution). Figures were produced using Surfer 22.1.

3.2.1 Geomorphological and spatial-statistical assessment of post-depositional risk

To evaluate the potential effect of post-depositional slope processes on the distribution of artefacts, a multi-criteria geomorphological analysis was conducted, combining terrain indicators with spatial-statistical analysis of archaeological point data.

As the study area is located on a sloping surface, we assessed whether the observed spatial patterns largely preserve the primary spatial patterning of prehistoric activity (*sensu* Rick 1976) or whether they reflect secondary displacement caused by slope-related geomorphological processes. Solifluction represents a cryogenic denudational process in which water-saturated soil slowly moves downslope under gravity, potentially producing elongated patterns parallel to the slope. Solifluction transport can be initiated at slope angles as low as 2.0°–3.0°.

Surface assemblages are also affected by additional biases, including ploughing disturbance, preservation factors and collection bias. These processes typically result in the underrepresentation of smaller flakes and technological by-products and the overrepresentation of larger, visually conspicuous pieces. Furthermore, the surface context does not allow precise chronological separation of individual reduction episodes.

To evaluate these potential effects, terrain gradient and slope aspect were calculated from the digital elevation model, and their relationship to the geometry of the artefact distribution was examined. This procedure allows the identification of spatial patterns compatible with primary spatial patterning as opposed to those likely influenced by post-depositional slope processes. The detailed methodology of the spatial analysis is provided in Appendix B.

Table 2a. Gyöngyöspata-Felső-Eresztvény, collection zone 1, lithic implement counts and ratios.

	Limnosilicite	Andesite	Quartzite	Total	% of tools	% of total
End-scraper	1			1	1,96	
Side scraper	7		1	8	15,69	
Borer	1			1	1,96	
Burin						
Combined tool	1			1	1,96	
Denticulated tool	2			2	3,92	
Notched tool	5		1	6	11,76	
Retouched flake	10			10	19,61	
Retouched RMF	13			13	25,49	
Diverse	8		1	9	17,65	
Tools total	48		3	51		15,64
Debitage	161	3	3	167		51,23
Waste product	91	1	7	99		30,37
Flake core	6	1		7		2,15
Laminar core	1			1		0,31
Pebble			1	1		0,31
Total	307	5	14	326		100,00
%	94,17	1,53	4,29	100,00		

Table 2b. Gyöngyöspata-Felső-Eresztvény, collection zone 2, lithic implement counts and ratios.

	Limnosilicite	Andesite	Quartzite	Total	% of tools	% of total
End-scraper	1			1	1,96	
Side scraper	5			5	13,51	
Borer						
Burin	1			1	2,70	
Combined tool						
Denticulated tool	1			1	2,70	
Notched tool	3			3	8,11	
Retouched flake	6			6	16,22	
Retouched RMF	16			16	43,24	
Diverse	4			4	10,81	
Tools total	37			37		33,64
Debitage	37	1		38		34,55
Waste product	19			19		17,27
Flake core	5	1	1	7		6,36
Laminar core	7			7		6,36
Pebble			2	2		1,82
Total	105	2	3	110		100,00
%	95,45	1,82	2,73	100,00		

3.2.2 Assessment of the functional character of the site complex

Concerning Middle Palaeolithic hunting strategies, the use of long-range projectile weapons (spearthrowers, bow) generally cannot be demonstrated for Neanderthal groups, although close-range spear use and possibly hand-thrown spears are well-attested (cf. Shea, 2006; Villa & Lenoir, 2009; Rots & Plisson, 2014). In open-air contexts, however, the exploitation of topographic affordances and solutions based on driving, encircling or topographic trapping may have played a significant role. Visibility would have been particularly important for the inter-group communication required for cooperative hunting.

To explore this aspect, we applied a GIS-based viewshed analysis performed using a digital elevation model (DEM) to interpret the spatial position of the site complex and to draw inferences regarding its possible function. The analysis focuses on a single factor: the extent to which the surroundings of the site complex may have been suitable, from the perspective of hunting and primary subsistence activities, for longer-term occupation.

The viewshed analysis identifies all terrain cells visible from the observer point under standard line-of-sight conditions. In addition, cross-sectional profiles were constructed at three topographically characteristic points across the Zám Stream valley in order to quantify slope gradients relevant to large game movement and hunting feasibility. The detailed methodology of the spatial analysis is provided in Appendix C.

4 Results

4.1 Lithic implements

4.1.1 Raw material use

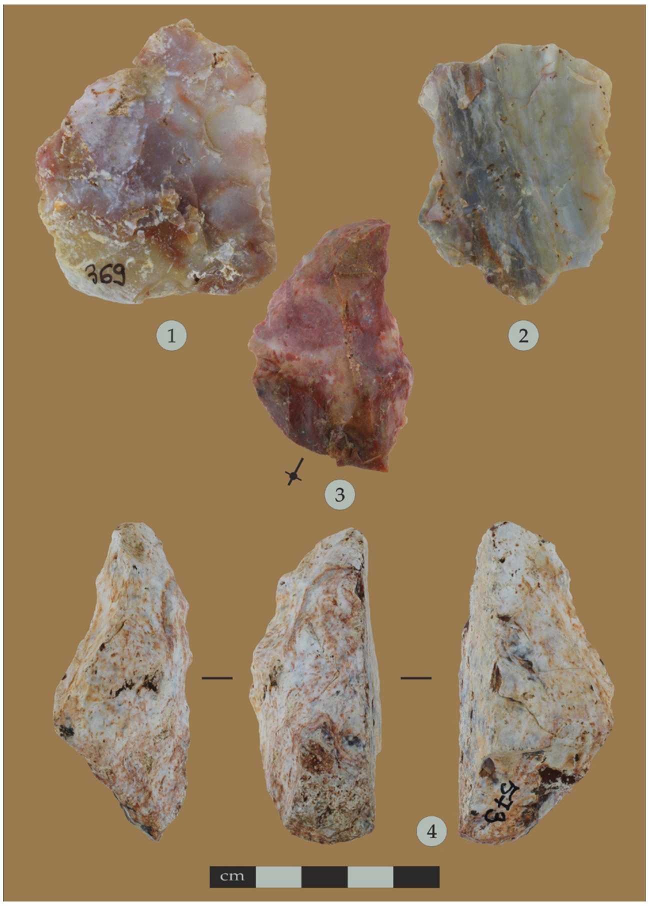
The raw material composition of the assemblage is relatively homogeneous: the overwhelming majority of the lithics were made from local limnosilicite (565 pieces, 94.01%). Andesite (8 pcs, 1.33%) and quartzite (28 pcs, 4.66%) are present in much smaller quantities. All quartzite pieces were considered to be of anthropogenic origin based on the presence of detachment negatives. As no significant gravel beds are known in the Gyöngyöspata Basin, the most probable source of this raw material is the valley of the Zagyva River. Except for a single flake, the andesite artefacts were made from a fine-grained raw material, with a homogeneous texture. This texture reflects rapid cooling at or near the surface, resulting in the formation of a fine-grained matrix (Haldar, 2020). Andesite with such favourable knapping properties occurs at several locations within the Gyöngyöspata Basin, although in varying quantities. In the descriptions that follow, the raw material is specified only for artefacts made from non-limnosilicite material.

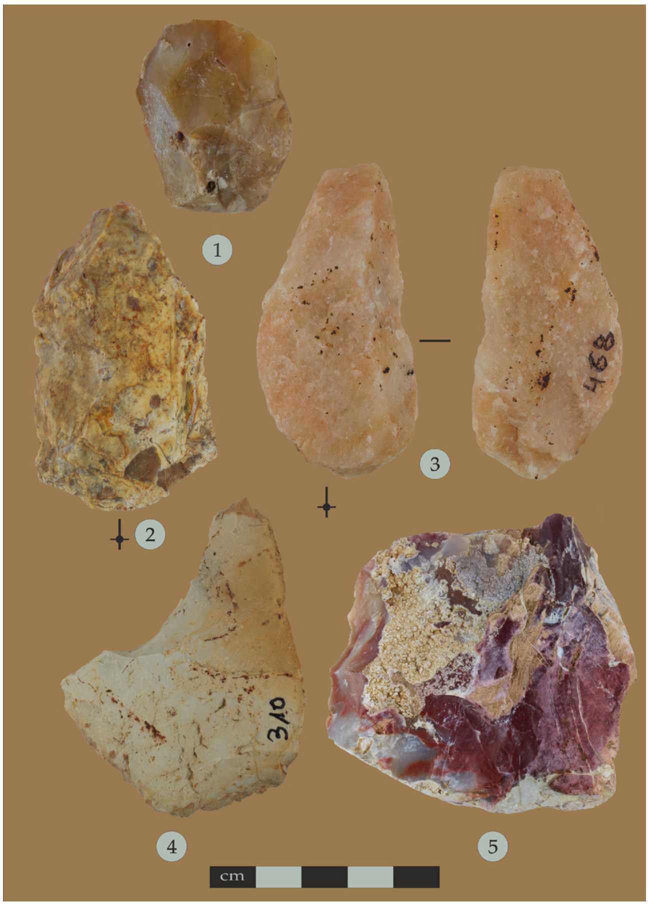
4.1.2 The tool assemblage

The tool assemblage is relatively large (114 pieces) and displays a high tool ratio (18.97%). Considerable variation, however, exists between the two collection zones. In CZ1, 51 tools represent 17.65% of the 326 finds, whereas in CZ2, 37 tools account for 33.64% of the 110 finds. The remaining 26 tools represent 4.3% of the total assemblage.

The high tool ratio is partly a consequence of collection conditions. Due to the dense natural raw material cover of the area, not all debitage and waste products were recovered, and the selection was inevitably biased toward more diagnostically informative pieces. Furthermore, most tools were made on naturally fragmented raw material nodules and are typically atypical, *ad hoc*, or opportunistic. Consequently, the classical Middle Palaeolithic typology of François Bordes (1981) applies only with limitations. Percentage values given in parentheses for individual tool types refer to the tool assemblage as a whole.

Notched tools are the most common type within the assemblage (16 pieces; 14.04% of tools: Fig. 8, 5; Fig. 9, 4–5; Fig. 10, 1–3). Side-scrapers number 14 pieces (13.16%), the majority being simple straight (7 pieces: Fig. 7, 1–2; Fig. 8, 1) or convex (4 pieces: Fig. 8, 3) forms. Among the double side-scrapers, one is straight-straight (Fig. 8, 4), one convex-concave (Fig. 7, 3), and one concave-straight (Fig. 8, 2). A single Quina-type convex side-scraper is present (Fig. 7, 4). End-scrapers and denticulated tools are each represented by four pieces (3.51% each; Fig. 9, 1), while a borer and a combined tool are represented by single specimens (0.88% each), along with two





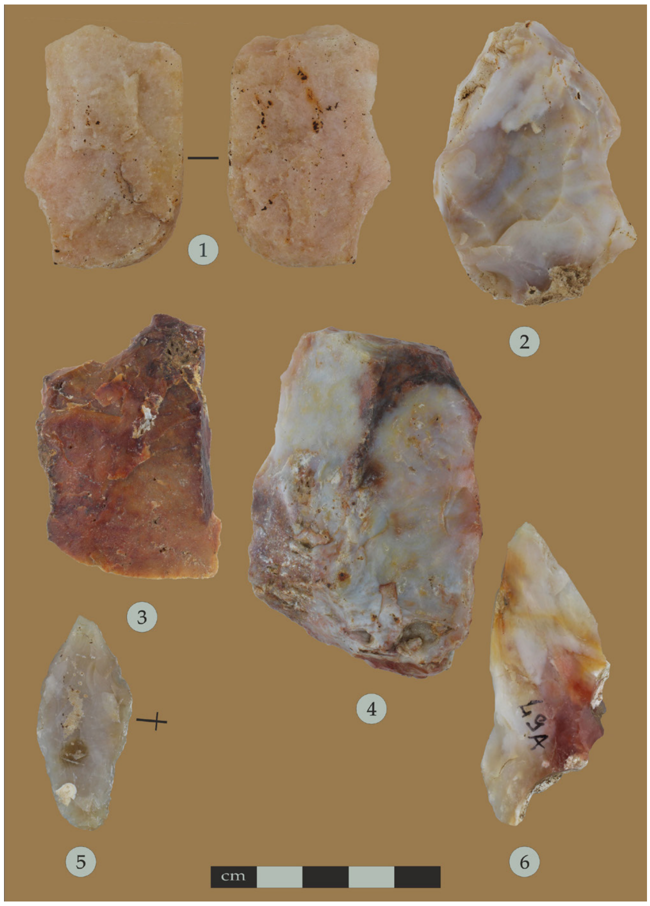


Fig. 7–10. Selected tools from the site complex. Photos: Attila Péntek

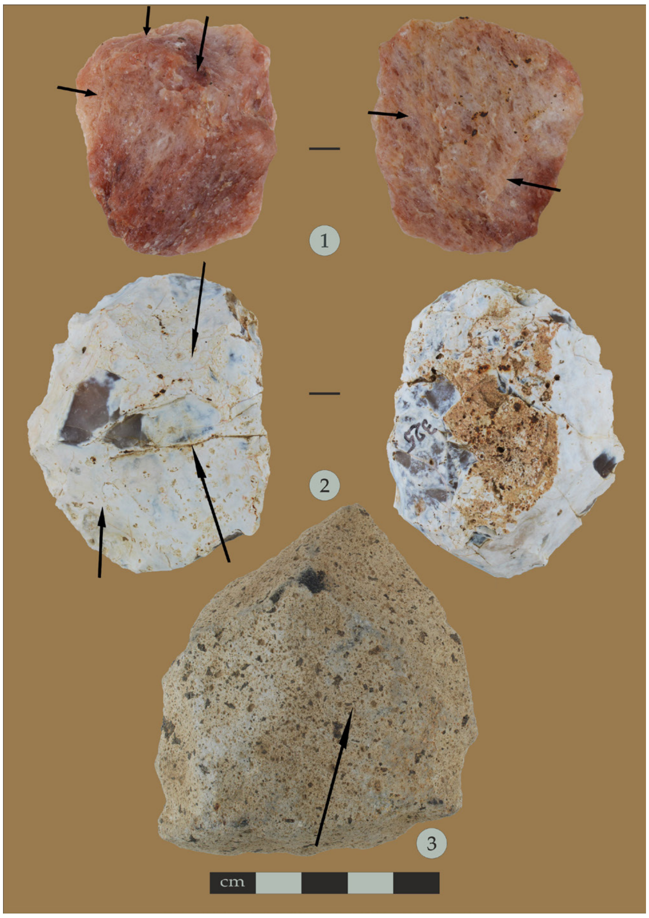


Fig. 11. Selected cores from the site complex. Photos: Attila Péntek.

burins (1.75%). The combined tool consists of a simple convex side-scraper and an unretouched notch (Fig. 8, 7).

Edge-retouched pieces are numerous: retouched flakes number 20 pieces (17.54%) and retouched raw material fragments 36 pieces (31.58%). The distinction between some of these pieces and side-scrapers was based on the retouched edge length and the quality of retouch. Detailed descriptions of the tools illustrated in Figs. 7–10 are provided in Appendix A.

4.1.3 Cores

The assemblage contains 26 cores, the majority of which are made of limnosilicite (23 pieces), with two andesite and one quartzite specimen also present. Flake production was the primary objective: except for eight sub-laminar cores intended for the production of elongated flakes, the remaining 18 cores are standard flake cores.

Several pieces are particularly noteworthy. A small, likely exhausted quartzite flake core measures 58.9×48.2×23.8 mm (Fig. 11, 1). An exhausted recurrent centripetal Levallois core measures 61.4×52.4×26.0 mm (Fig. 11, 2). A large, thick-sectioned andesite core has the dimensions 75.7×68.6×27.9 mm (Fig. 11, 3).

4.2 Results of the spatial analysis

4.2.1 Collection Zone 1

In all categories, the major axis of the Standard Deviational Ellipse is oriented perpendicular to the slope direction, which strongly suggests that the artefacts were not displaced downslope (Fig. 12–15). If the assemblage had undergone post-depositional downslope movement, the ellipses would be expected to elongate parallel to the slope direction; this pattern is not observed in any category. The slope angle measured along the major axis is extremely low in all cases, confirming that the orientation of the distribution does not follow the terrain gradient.

Rick's selection analysis revealed a moderate difference in the areal ratio of debitage and cores, suggesting functional differences in activity areas rather than a clear size-selective displacement process. In the case of cores, the ellipse parameters are statistically uncertain given the sample of only seven pieces, and this partial result should therefore be treated with caution.

Overall, the results indicate that the material from this collection zone is situated on a surface where the influence of natural redistribution processes appears to have been minimal, and the find distribution most probably reflects the spatial patterning of past human activity. The finds were most likely brought to the surface as a result of deep ploughing before vineyard establishment.

4.2.2 Collection Zone 2

In all categories, the slope angle measured along the major axis is low, and none of the Standard Deviational Ellipses shows an orientation parallel to the slope direction – debitage and cores display a transverse orientation, while the total finds and tools show an oblique arrangement (Fig. 12–15). The latter presents a slightly less favourable picture compared to CZ1, where all categories were clearly transverse; however, an oblique orientation alone does not indicate post-depositional movement. In all cases, the

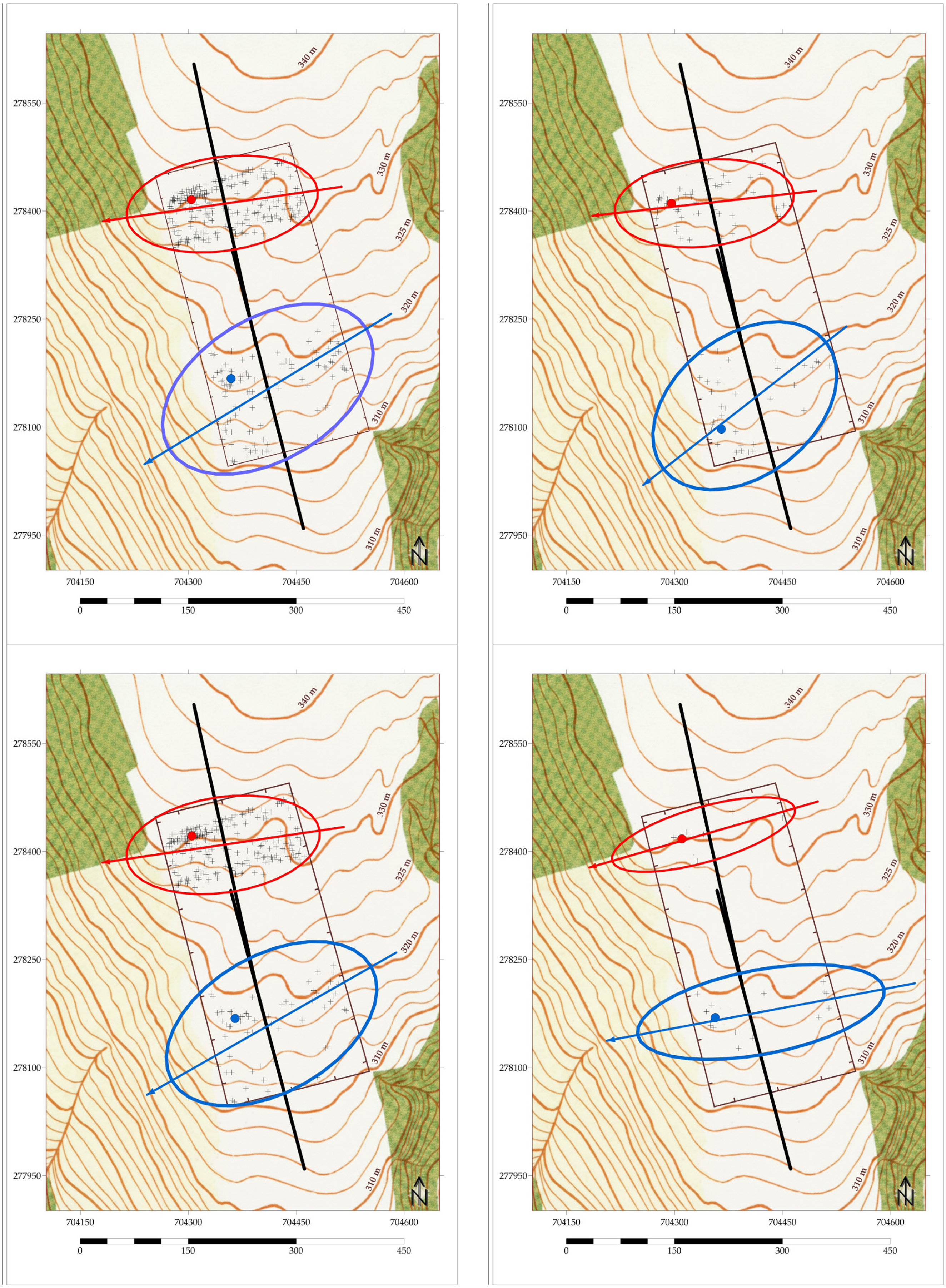


Fig. 12–15. Standard Deviational Ellipses: top left (fig. 12) - of the total assemblages of the two collection zones; top right (fig. 13) - of the tools of the two collection zones; bottom left (fig. 14) - of the knapping by-products (debitage) of the two collection zones; bottom right (fig. 15) - of the cores of the two collection zones. Maps: Attila Péntek.

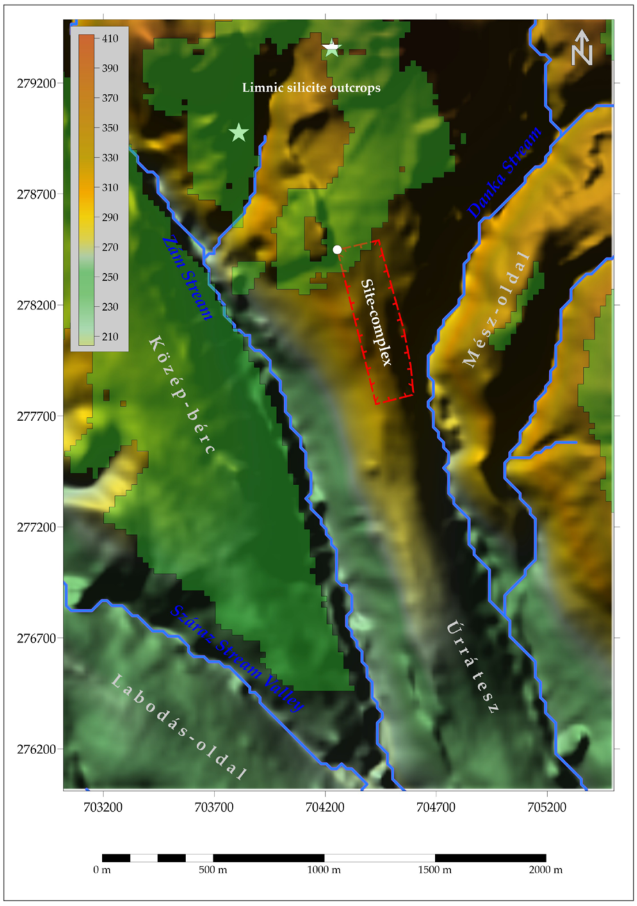


Fig. 16. Viewshed constructed with a 2.5 km radius from the northwestern corner of the site complex. Map: Attila Péntek

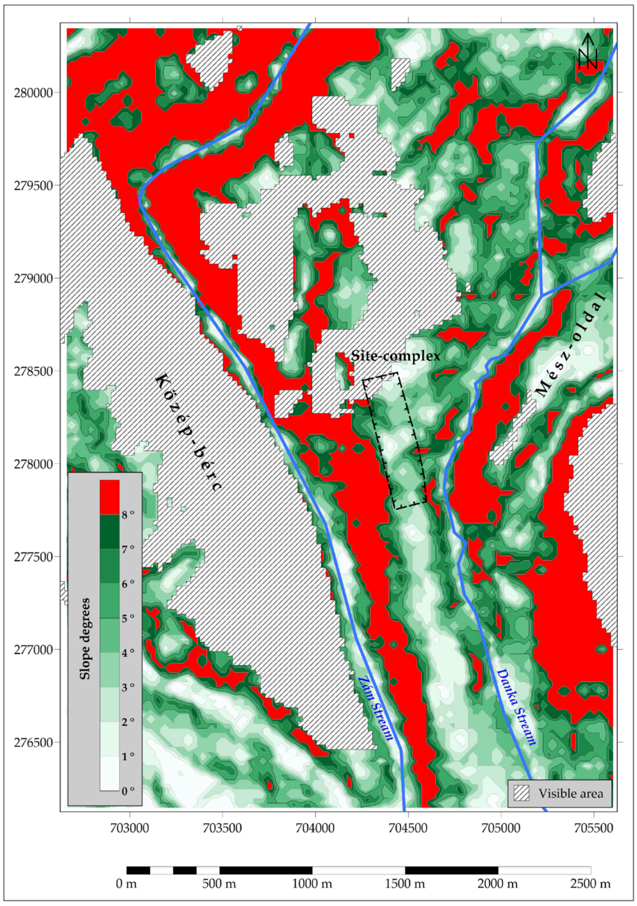


Fig. 17. Slope conditions of the site complex's surroundings, the viewshed is also indicated. Map: Attila Péntek

Slope Anisotropy values indicate that the terrain is steeper along the minor axis than the major axis. Within the logic of the analysis, this is not necessarily a risk indicator; rather, it confirms that the elongation does not follow the slope gradient. The dispersion of finds along the minor axis may reflect either multiple occupation episodes or functional differentiation within the activity area. Rick's selection analysis revealed a moderate difference in the areal ratio of debitage and cores, suggesting natural functional differences rather than a clear size-based selection process. The results for the core category should nevertheless be treated with caution, as the sample of 14 pieces, while somewhat more favourable than the seven pieces from CZ1, still lies at the lower boundary of the method's reliability.

Overall, the results suggest that the CZ2 assemblage is also situated within a relatively stable depositional context, where the effect of natural redistribution processes was minimal, and the find distribution most probably reflects the spatial patterning of past human activity. As in the case of CZ1, the finds from CZ2 were most likely brought to the surface as a result of deep ploughing before vineyard establishment.

4.2.3 Results of the viewshed analysis

Fig. 16 shows a detailed extract of the viewshed constructed with a 2.5 km radius from the artefact-rich northwestern corner of the site complex, indicated in spring green on the digital elevation model (DEM). The area to the north of the site complex is unfavourable for hunting, as it consists of open, gently sloping hillside. Part of the area to the east – the Mész-oldal zone between the Danka Stream and the unnamed dry valley below Havas-hegy – was accessible to Pleistocene megafauna. Slope angles either do not exceed the 8° (14%) threshold considered critical for ungulates (Krist & Brown, 1994), or steeper sections could be negotiated by diagonal traversal. Steep slopes would, of course, also significantly reduce the effectiveness of human hunting strategies such as encirclement or exhaustion drives. Rather than

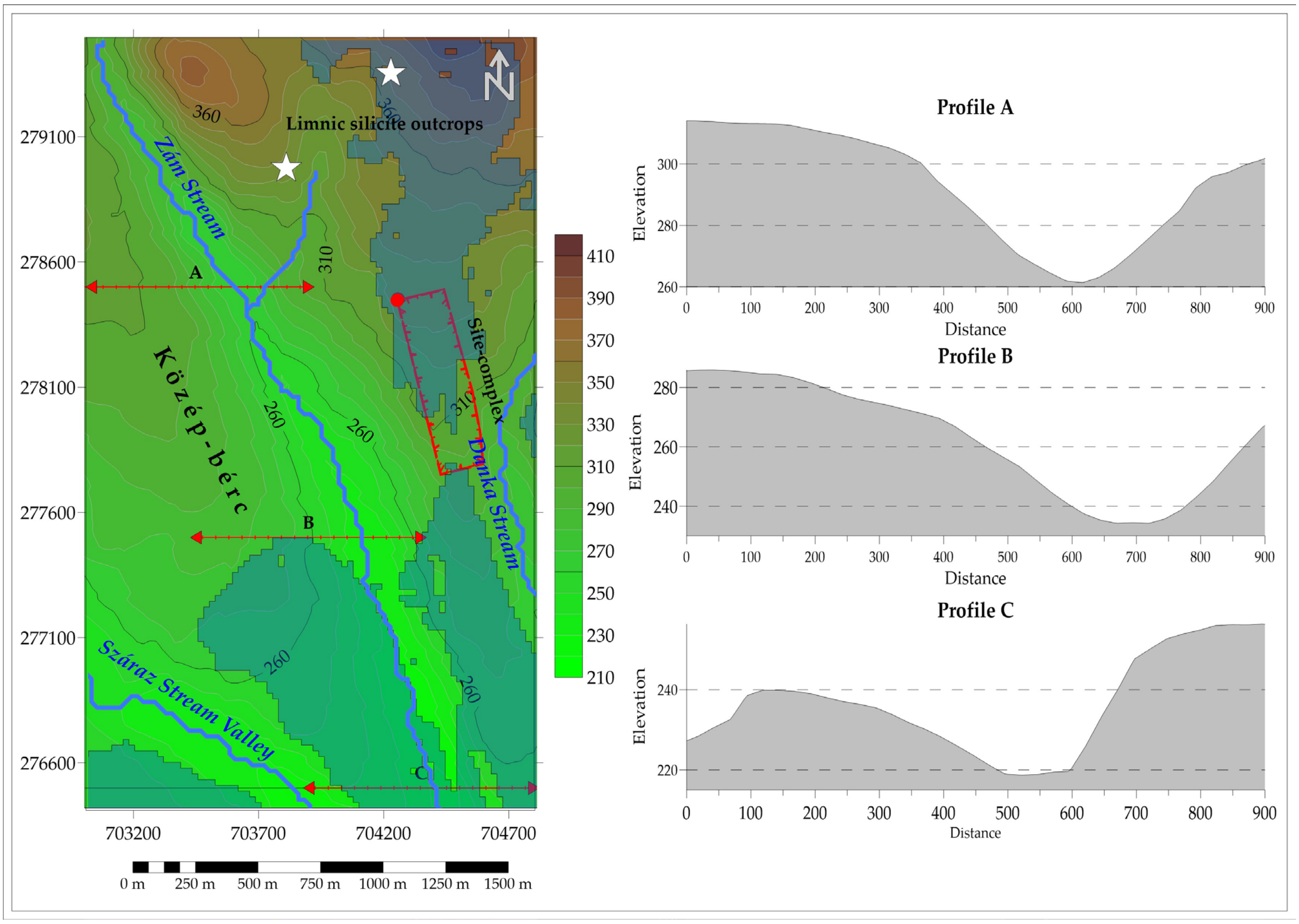


Fig. 18. Three cross-section profiles across the Zám Stream valley. Map: Attila Péntek.

the open Gyöngyöspata Basin to the south and southwest, the focus of hunting strategy most probably lay to the west, towards the Közép-bérc plateau and the Zám Stream valley. The slope conditions of the site complex's surroundings, with the viewshed indicated, are shown in Fig. 17.

From a hunting perspective, the Mész-oldal area mentioned above was likely unsuitable because of its open character. The narrow valley of the Danka Stream below it may appear more favourable due to its topographic bottleneck; however, an important limitation must be considered. Most herd animals – potential prey species of the Pleistocene megafauna – rely strongly on group cohesion, which provides protection against predators and facilitates orientation and foraging. As a result, solitary individuals are relatively uncommon, typically occurring only in specific situations such as illness or injury, displacement from dominance hierarchies, or during the reproductive season when males may temporarily move independently.

For a more detailed analysis, three cross-sections, each 900 m in length and spaced 1 km apart, were constructed across the Zám Stream valley, which appeared more promising from a hunting perspective (Fig. 18). The cross-sections are designated A, B and C from northwest to southeast, respectively. Slope angles were calculated based on the last visible point on the western and eastern slopes when viewed from the lowest point of the valley. For profile A, these values are 15.3% and 17.20%; for profile B, 12.86% and 14.37% ("Strongly sloping/Moderately steep", Reinhold *et al.*, 2006, p. 12, Table 7). For profile C, the values decrease to 5.81% and 12.25% ("Sloping" and "Strongly sloping/Moderately steep" respectively, Reinhold *et al.*, 2006, p. 12, Table 7). The side of the stream valley facing Közép-bérc is therefore not critical for animal movement as viewed from the basin, particularly when the possibility of diagonal traversal along the slope is taken into account. On the southwestern side of the Zám Stream valley, in the Közép-bérc area, a previously identified large-scale site complex is located, the assemblage of which has not yet been published. As contemporaneity cannot be demonstrated for open-air sites, the relationship between the two site complexes remains an open question for the time being.

These results collectively suggest that the spatial structure of the assemblage largely preserves the original patterning of prehistoric activity rather than being the product of slope-related post-depositional processes.

5 Discussion

The functional interpretation of the site complex remains uncertain. Its character as a base camp, a temporary hunting camp, or a knapping workshop cannot be unambiguously established. This uncertainty results partly from the relatively small quantity of surface-collectable material, despite the high tool ratio within the assemblage, and partly from the fact that a considerable proportion of the area is currently occupied by patches that are inaccessible or only poorly suited to archaeological investigation.

5.1 Taphonomic variability and multi-phase occupation

One of the most striking characteristics of the collected assemblage is the considerable variability in the surface condition and patina of the artefacts. This variability may reflect differences in raw material properties, chronological variation, or post-depositional taphonomic processes. While some pieces show little or no patina, others display varying degrees of surface alteration.

Several artefacts are covered by a patina resembling desert varnish, a dark, manganese-rich coating typically forming on exposed rock surfaces in arid and semi-arid regions (Perry *et al.*, 2005). Another common form of surface alteration is so-called gloss patina, which is primarily a result of soil solution-related chemical processes. The adsorption of amorphous silica from the surrounding depositional environment may lead to the formation of such glossy surfaces (Howard, 2002).

The surfaces of strongly patinated pieces – particularly along their edges – often appear heavily worn and rounded. Taken together, these observations strongly suggest that the assemblage accumulated over multiple periods and reflects more than one occupation episode.

5.2 The dichotomy observed in the tool assemblage

Alongside finely worked, typologically identifiable tools, the assemblage also contains numerous ad hoc, opportunistically produced pieces from naturally fragmented raw material nodules. Many of these represent expedient implements rather than tools intended for long-term use (non-curated tools *sensu* Binford, 1979). Such non-economic use of raw material is commonly observed in knapping workshops where suitable raw material is readily available.

Distinguishing pseudo-artefacts – geofacts produced entirely by natural processes – and pseudo-tools with accidental, tool-like modifications from genuine artefacts often presents serious interpretive challenges. Some ambiguous pieces may even have been used as expedient tools. Evan Peacock's (1991) scoring method introduced a simple, systematic way to reduce subjective judgement by standardising the assessment of key lithic attributes. Its main limitation is a substantial grey zone, where natural and human-made flakes receive similar scores, and its reliability varies with raw material and context. Consequently, it functions best as a preliminary screening tool that must be complemented by other analytical approaches.

Recent studies have attempted to refine or replace such scoring systems (Wiśniewski *et al.*, 2023). In the case of limnosilicite, natural processes such as frost fragmentation or slope-related mass movements may produce fractures that can be misleading in this respect.

5.3 Regional parallels

The exhausted recurrent Levallois or Proto-Levallois ("simple prepared-core" technology *sensu* White & Ashton, 2003) core present in the technological profile of the Felső-Eresztvény site complex, and the application of the Levallois method, are relatively rare in the domestic open-air context. This is probably partly the result of a research gap and partly a consequence of the neglect of surface assemblages. On the basis of the typologically dominant standard Mousterian tools, part of the assemblage can unquestionably be assigned to Mousterian industries with partial application of the Levallois concept (Levallois-Mousterian *sensu* Kozłowski, 2016). The sporadic presence of Levallois elements at Gyöngyöspata raises the question of whether this technological choice appears marginal due to a deliberate reduction strategy conditioned by raw material quality, or as a result of the selective nature of surface collection.

The recently identified sites of Szurdokpüspöki-Lapos-tanya (SzP-21) and Tilalmas-tető (SzP-16) in the immediate vicinity of the Gyöngyöspata Basin (Péntek *et al.*, 2025), together with sites identified in the southern and southwestern sectors of the basin, provide direct analogies, indicating an extensive, technologically homogeneous presence in the western Mátra Mountains. Based on the typological spectrum – particularly the high proportion of side-scrapers – strong parallels may be identified with the classic Mousterian sites of the Bükk Mountains (Bartucz *et al.*, 1940; Gábori, 1976; Mester, 1989; 1995; 2004; 2006; 2022; Mester & Patou-Mathis, 2016; Mester *et al.*, 2023).

It is important to highlight, however, the differences in raw material procurement strategies. For understandable geological reasons, while the industry at Felső-Eresztvény is characterised by the near-exclusive dominance of local limnosilicite, Subalyuk Cave presents a considerably more diverse spectrum that includes non-local raw material types. The assemblage from layer 4 of Büdöspest Cave is characterised by the dominance of metarhyolite (89.3%). The greater part of the Felső-Eresztvény industry is more closely reminiscent of the side-scraper-rich Typical Mousterian, but certain scraper types, the high proportion of transverse side-scrapers, and the notched tools suggest affinities with the Quina-type Mousterian (Mester, 1995). Given the differing properties of the raw materials used, the Bükk assemblages are difficult to compare directly with the Mátra limnosilicite industry on technological grounds.

5.4 Central European analogies

While the few Levallois elements present in the assemblage of the site complex would not in themselves call for such a discussion, the sporadic application of the Levallois method is attested in the assemblages of numerous sites within the Gyöngyöspata Basin, and a brief overview limited to Central Europe is therefore warranted.

Numerous Mousterian sites are known from the core countries of Central Europe (Austria, Czech Republic, Poland, Slovakia) and the adjacent transitional zones (Croatia, Romanian Transylvania, Serbia, Ukrainian Transcarpathia), where the application of the Levallois concept is attested. The majority of these sites date to the last interglacial (Eemian) and the first half of the Würm glacial (ca. 130,000–60,000 BP). The most important parallels are summarised below, without claiming exhaustiveness, to illustrate the wide distribution of this technology across the region.

In Austria, several significant cave sites along the Danube valley and the margins of the Eastern Alps exhibit a Mousterian character. Unlike several open-air sites, the well-known Middle Palaeolithic cave sites of Austria (Gudenus Cave, Repolust Cave) have not yielded unequivocal evidence for the application of the Levallois concept (Obermaier & Breuil, 1908; Mottl, 1951; Modl *et al.*, 2014; Schmid & Nigst, 2014). The Levallois concept is attested in the assemblage of Ramesch-Knochenhöhle (Rabeder, 1985). Its intensive application is known from the sites of Großweikersdorf-Kogel (Neugebauer-Maresch & Thomas, 2012; 2013) and Csaterberg (Schmid *et al.*, 2021).

In Poland, the presence of the Levallois technique in cave assemblages is often linked to specific facies. The oldest (that is, pre-OIS 3) Middle Palaeolithic record in the Kraków region, based only on geological interpretations, comprises a Levallois-Mousterian predominantly. Biśnik Cave is a cave site with a long stratigraphic sequence, where Micoquian and Levallois elements occur in parallel or alternating succession (Cyrek *et al.*, 2014). At the open-air site of Kraków-Zwierzyniec I, a Shaitan Koba-type Levallois-Mousterian industry was identified in Area P alongside the Micoquo-Pradnikian assemblage (Chmielewski, 1975; Chmielewski *et al.*, 1977; Kozłowski, 2006). The Piekary complex of Palaeolithic sites (IIa and III) has yielded Micoquian and Levallois-Mousterian industries (Sitlivy *et al.*, 2008).

In Slovakia, the Levallois technique is particularly prominent at the travertine sites of the Szepes region and in the Upper Nitra valley. Artefacts typical of a younger phase of the Levalloisian technique were found at

Hôrka-Ondrej (Kaminská *et al.*, 1993) and Vyšne Ružbachy, and those of Mousterian with Levalloisian technique at Beharovce-Sobotisko. At the sites of Bojnice I (Bajmóc-Prepoštská Cave) and Prievidza-Mariánsky vŕšok (Privigye), the Levallois technique was adapted to local raw materials (andesite, quartzite, limnosilicite) (Neruda & Kaminská, 2013; Kaminská, 2014).

Northern Bosnia and Herzegovina, Croatia and Serbia. Both cave and open-air sites in the western Balkan region demonstrate the technological diversity of the Levallois concept.

In northern Bosnia, Mousterian layers have been documented at numerous sites (e.g. Kadar, Kamen, Londza, Ratusa Cave, Visoko Brdo and Zobište), whose assemblages are characterised by a notable importance of Levallois debitage (Montet-White, 1994; Rajkovaca, n.d.).

In the older layers (unit K) of Vindija Cave (Croatia), typical Mousterian tools predominate, and there is clear evidence for the use of Levallois technology (Ahern *et al.*, 2004; Janković *et al.*, 2006). At Krapina Cave (Croatia), the application of the Levallois concept was observable in the earlier layers. Despite the small sample, Levallois flakes appear to be particularly frequent as blanks for tools made on exotic raw materials (Simek & Smith, 1997).

In Serbia, the Levallois concept and even proto-Levallois (simple core technology; White & Ashton, 2003) are well documented in the assemblages from the Morava valley (Samaila–Vlaška Glava near Kraljevo; Ježevica–Vojnovića in the vicinity of Zablaće) and the surrounding uplands (Pešturina Cave) (Mihailović, 2014).

In Romania, numerous Typical Mousterian sites applying the Levallois concept are known, including the lower layers (I–III) of Ripiceni-Izvor, Cheia-La Izvor, Gornea, Boineşti and Remetea-Somoş (Pop, 2013; Doboş, 2017). In Dobrudja, the site of Mamaia Sat represents one of the most important open-air occurrences of the Levallois technique (Balescu *et al.*, 2015).

In Ukraine (Transcarpathia and western Ukraine), Korolevo (Királyháza) I (layers III and 2b) is one of the most significant stratified sites in Europe, where the development of the Levallois technique has been traced over a long chronological span (Demidenko & Usik, 1993; 1995; Usik, 2013). Near Korolevo, at the foot of Sorgeidy Hill, the partial application of the Levallois concept in the assemblage of Sorgeidy Complex I is documented by cores and flakes (Sitlivy, 1989). At the site of Velykyi Glybochok, the flint finds of the early Mousterian were produced using the Levallois method (Łanczont *et al.*, 2014).

On the basis of the Central European analogies, the industry of Felső-Eresztvény, and probably that of numerous further sites in the Gyöngyöspata Basin, fits well within the broader series of open-air sites in the region where the technological character was determined primarily by adaptation to local raw materials. The Levallois concept – as in the parallels examined – appears only sporadically. The emphasis throughout remains on stable, flake-oriented reduction strategies and the Mousterian tool repertoire. The parallels suggest that this industry of the Western Mátra represents a technological tradition widespread across a broader geographical unit, well adapted to the prevailing environmental conditions of the Middle Pleistocene.

6 Conclusion

The Felső-Eresztvény site complex, identified on the northern margin of Gyöngyöspata, constitutes one of the most extensive and complex Middle Palaeolithic surface assemblages in the Gyöngyöspata Basin. Within a smaller, relatively well-defined part of the area, elongated flakes and several sub-laminar cores were recorded. Among the tools, a few atypical end-scrapers were identified. It remains unclear how this small quantity of material relates to the dominant flake industry of the site complex. On the basis of find distribution, raw material composition and typological characteristics, the site complex, covering more than 13.9 hectares and situated on a ridge, most probably preserves the traces of repeated occupations based on the exploitation of local limnosilicite. Alongside the probable workshop character of the site complex, the possibility of short-term, functionally complex occupations cannot be entirely excluded. The latter possibility, however, does not appear likely given the absence of favourable hunting opportunities in the surrounding area.

The differences in taphonomic conditions and patina, together with the co-occurrence of finely worked tools and ad hoc pieces, suggest that the site complex represents multiple occupation periods and is by no means the product of a single functional event or knapping episode. The technological and typological characteristics – the dominance of notched tools, the presence of numerous varied side-scrapers and denticulated tools, and the complete absence of Upper Palaeolithic elements – show close affinities with the Mousterian sites of the Bükk Mountains. The partial, non-systematic application of the Levallois concept is indicated by the Levallois core and several Levallois-like flakes.

The Felső-Eresztvény site complex represents an important new regional data source. It has the potential to advance our understanding of Middle Palaeolithic technological variability, raw material use and open-air settlement patterns. At the same time, the limitations of surface collection – disturbance, artefact-free patches and taphonomic distortions – require considerable caution in interpretation.

The significance of the site complex lies primarily in its capacity to add a new dimension to Middle Palaeolithic research in the Gyöngyöspata Basin. In the future, targeted surface collections and, above all, small-scale test excavations could contribute to a more precise chronological, stratigraphic and functional interpretation of the assemblage. The site complex also offers an opportunity to examine the role of Mousterian and Levallois elements within the technological diversity of Central European Neanderthal communities.

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Appendix

Appendix A – Artefact descriptions

A.1 Side-scrapers

Thick, simple side-scraper on a raw material fragment. The cross-section is approximately triangular in shape, with a thick, approximately straight base. The straight right edge is semi-abruptly retouched (58.9×48.2×23.8 mm; Fig. 7, 1).

Thick, simple side-scraper on a raw material fragment. The cross-section is irregularly triangular; the irregularly shaped edge on the left side is thick. The right edge is approximately straight and semi-abruptly retouched. At the midpoint of the edge, two removals resembling denticulation or shallow notching are present (54.2×40.3×18.8 mm; Fig. 7, 2).

Simple side-scraper on a raw material fragment. The straight left edge is semi-abruptly retouched. The right edge is thick, forming a natural back (48.5×38.3×15.8 mm; Fig. 8, 1).

Simple side-scraper or retouched raw material fragment. The left side of the obtuse-angled, irregularly shaped distal end is slightly concave, the right side straight. Both sections are semi-abruptly retouched (35.0×33.4×14.1 mm; Fig. 8, 2).

Side-scraper on a raw material fragment. The slightly convex section of the distal end of the right edge bears fine retouch above and two shallow notches or denticulations below (76.3×44.4×15.9 mm; Fig. 8, 3).

Straight-edged side-scraper on a raw material fragment. A retouched section approximately 25 mm in length is present at the proximal end of the left edge. The thicker right edge forms a natural back (60.6×31.8×14.6 mm; Fig. 8, 6).

Simple side-scraper on an elongated, thick-sectioned pseudo-Levallois flake with a dihedral platform. The straight distal end of the right edge is inversely retouched (64.7×39.2×17.0 mm; Fig. 9, 2).

Simple straight-edged side-scraper on a quartzite flake. The distal end of the left edge is abruptly retouched. The right edge forms a natural back (66.8×33.3×18.0 mm; Fig. 9, 3).

Convex-concave double side-scraper on an off-axis (*déjeté*) flake. Both edges are semi-abruptly retouched in a scalar-stepped pattern (50.9×41.6×14.8 mm; Fig. 7, 3).

Double side-scraper on a flake. The proximal end of the left edge and the right edge are semi-abruptly retouched (43.1×34.8×11.4 mm; Fig. 8, 4).

Thick Quina-type side-scraper on a raw material fragment. The edge on the right side is convex with steep scalar-stepped retouch (67.8×29.5×28.8 mm; Fig. 7, 4).

Large, thick alternate side-scraper on a raw material fragment. The distal end of the left edge bears straight semi-abrupt direct retouch, while the proximal end bears straight inverse retouch. The distal end features a steeply, coarsely retouched section with use-damage (81.7×55.6×24.7 mm; Fig. 10, 4).

Side-scraper with an irregularly convex transverse edge on a raw material fragment (20.6×46.1×7.9 mm; Fig. 10, 5).

Straight-edged inversely retouched side-scraper on a raw material fragment (63.4×25.1×14.2 mm; Fig. 10, 6).

A.2 Notched tools

Small notched tool on a raw material fragment. There is a shallow, retouched notch at the distal end. A short retouched section is visible at the distal end of the left edge, below which a possibly unretouched small notch may be present (38.5×31.9×11.2 mm; Fig. 8, 5).

Large tool on a raw material fragment. On the left edge, there is an unretouched notch with use-wear traces (67.6×53.6×16.1 mm; Fig. 9, 4).

Large, thick-sectioned tool on a raw material fragment. Two coarse, retouched notches are visible on the left edge in the orientation shown (62.8×59.5×23.5 mm; Fig. 9, 5).

Notched tool on a thick raw material fragment or flake. A semi-abruptly retouched notch is present on the right edge (60.9×43.3×21.8 mm; Fig. 10, 2).

Notched tool on a raw material fragment. A shallow, retouched notch is present on the left side of the distal end; thinning retouch is visible on the upper face. Minor use damage is present within the notch (57.8×37.9×18.4 mm; Fig. 10, 3).

Atypical tool on a cortical quartzite pebble slice produced by the bifacial anvil technique. On the thinner edge opposite the natural back, two longer retouched notches are present in opposing directions – one direct and one inverse – placed one above the other (57.8×37.9×18.4 mm; Fig. 10, 1).

A.3 Combined tool

Combined tool on a raw material fragment. The distal end of the right edge forms a simple convex side-scraper; a small notch is present on the concave middle section of the left edge (53.5×31.3×16.4 mm; Fig. 8, 7).

A.4 Other tools

End-scraper on a raw material fragment. The slightly arched, semi-abrupt working edge is resharpened, with partial use-wear traces (44.4×34.3×20.8 mm; Fig. 9, 1).

Appendix B – Geomorphological and spatial-statistical assessment of post-depositional risk

B.1 Spatial summary of find distribution – Standard Deviational Ellipse

The spatial configuration of each find category was characterised using the Standard Deviational Ellipse (SDE), which simultaneously determines the location of the centroid, the lengths of the major and minor axes, the elongation, and the principal orientation (azimuth) (Fig. 12–15). The ellipse covers the 95%, i.e. 2-sigma (2σ), spatial extent of the finds. These parameters served as the geometric basis for evaluating the directional patterning of the distributions.

Elongation (expressed as the ratio of the major to the minor axis) characterises the shape of the distribution, ranging from a circular distribution with a value of 1.0 to a strongly elongated, linear pattern. High elongation does not in itself indicate post-depositional disturbance – orientation is the determining factor: a transverse arrangement relative to the slope is a typical indicator of primary spatial patterning conditions, whereas elongation parallel to the slope suggests the influence of slope processes.

The find concentration index, calculated from the area of the SDE, expresses the number of finds per unit area (1000 m^2). This allows the distinction between diluted, dispersed (probably redistributed) and intensive, clustered, potentially primary spatial patterning zones.

The analysis was run in parallel for four find categories: all finds (total), retouched tools (tool), knapping by-products (debitage), and cores (core).

B.2 Terrain correlation

B.2.1 Determination of general slope conditions. The general slope angle and slope aspect at the centroid of the SDE were estimated using a multi-directional finite difference sampling scheme. The sampling radius was determined adaptively, calibrated to the length of the major axis and the resolution of the DEM, in order to minimise error arising from DEM noise while ensuring sufficient spatial coverage for the representation of regional slope conditions.

B.2.2 Directional slope measurement along the major and minor axes. In addition to the general slope angle, directional slope components were calculated along the major and minor axes of the SDE by linear regression of elevation samples taken at regular intervals along the axes. This enabled the quantification of slope anisotropy: the analysis examined whether the terrain is steeper in the direction of the major axis or in the transverse direction. If the slope along the major axis is substantially greater than along the minor axis, and the SDE is oriented parallel to the slope direction, this is considered a strong indicator of directional slope processes.

B.3 Density asymmetry – Kernel Density Estimation and hotspot analysis

Internal clustering within individual assemblages was characterised using Kernel Density Estimation (KDE). The spatial offset between the centroid of the SDE and the density maximum of the KDE (hotspot) was measured, and the magnitude and direction of this displacement were evaluated relative to the slope aspect.

The relative hotspot displacement compares the hotspot–centroid distance to the length of the major axis. When this value approaches 1.0, the density core is located at the margin of the ellipse, indicating strong density asymmetry. Hotspot displacement in the slope direction is interpreted as an indicator of gravity-induced reworking, whereas transverse displacement is considered compatible with functionally or behaviourally structured spatial organisation.

B.4 Angular deviation and orientation analysis

The angular deviation between the slope aspect and the major axis of the SDE was calculated and classified as parallel (<22.5°), oblique (22.5°–67.5°) or transverse (>67.5°). A parallel arrangement under moderate or steep slope conditions – particularly when combined with high slope anisotropy – is interpreted as an indication of slope process-induced redistribution, whereas a transverse arrangement under low and isotropic slope conditions is treated as evidence of primary spatial patterning.

B.5 Rick's selection index

Following Rick (1976), the ratio of the dispersal areas of debitage and heavier pieces (cores) was calculated. A ratio exceeding 2.0 indicates strong natural size-based selection: smaller, lighter flakes have been dispersed across a considerably larger area on the slope than the more stable, heavier cores. This size class-specific dispersal is one of the most characteristic field indicators of gravitational transport.

B.6 Stability Coefficient

In addition to the risk classification, a normalised Stability Coefficient (SC) was calculated on a 0–1 scale, relating the direction of hotspot displacement to the slope aspect. SC = 0 denotes complete geomorphological control (downslope migration), while SC=1 denotes dominant anthropogenic control (primary spatial patterning). On flat terrain, the coefficient assumes a higher baseline value, as limited topographic relief inherently constrains gravitational movement.

B.7 Composite post-depositional risk assessment

The geomorphological and spatial-statistical indicators were integrated into a composite post-depositional risk assessment, which assigns each assemblage to one of three categories. The classification is built on four principal criteria, whose weighting is based on models in the literature concerning the destructive effect of slope processes on archaeological contexts (Rick, 1976; Lenoble & Bertran, 2004; Bertran *et al.*, 2012): the slope angle along the major axis; the combination of slope anisotropy and orientation; parallelism relative to the slope direction; and the degree of elongation of the distribution. The three defined categories are as follows: Low risk – the distribution is probably primary spatial patterning; the direction of elongation is perpendicular to the slope, or the terrain is near-flat; Moderate risk – moderate distortion cannot be excluded; the context requires cautious interpretation; High risk – strong post-depositional redistribution is probable; the spatial arrangement of finds is determined primarily by gravity and erosion. This framework provides a reproducible basis for distinguishing geomorphological forcing effects from anthropogenic spatial patterning on sloping terrain. The results should always be interpreted in conjunction with field observations and archaeological contextual data.

Appendix C – Viewshed analysis

Viewshed analysis is a fundamental function of geographic information systems, determining which areas are visible from a given point. In archaeological contexts, the method is used primarily to investigate the location of sites and settlement complexes (Jones, 2006; Čucković, 2015). It is assumed that the visibility relationships between base camps, temporary hunting camps and nearby satellite points may have played an important role in communication and cooperative hunting strategies.

Based on analogies from open-air sites in the Cserhát Mountains, Middle Palaeolithic occupations are frequently associated with topographic bottlenecks. These typically take the form of blind valleys or natural passages – gorges, steep valleys, river crossings – where animal herds are forced to converge and move in a single direction. Hunters would wait at such locations, knowing that the terrain prevented the animals from dispersing or detouring. Such a location serves as the point of passive waiting and herd encirclement. A closely related concept is the topographic neuralgic point, which designates the terrain feature where prey becomes most vulnerable or where the hunter has the greatest opportunity for intervention. Such points may include the crest of a steep ascent, where animals become fatigued and slow down; the edge of a marshy area, where animal movement becomes uncertain; or a blind bend or ridgeline from which the hunter can appear unexpectedly, concealed by the terrain until the moment of approach (Péntek, 2014–2015). The distinction between the two concepts is not arbitrary. While the bottleneck regulates channelling and mass movement, the neuralgic point is the locus of tactical advantage – the place where the outcome of the hunt is decided, where the actual kill takes place or where the herd is directed towards a natural hazard such as a cliff edge.

If we assume that the site complex was not exclusively used as a knapping workshop, the topographic conditions for hunting opportunities must be examined. To investigate this assumption, a viewshed analysis was performed with the following parameters. The analysis was centred on the artefact-rich northwestern corner of the site complex with a radius of 2.5 km. Observer height was set to 1.65 m above ground level, representing the eye level of a standing adult. Target height was set to 1.65 m above ground level, approximating the lower boundary of the shoulder or back height of large Pleistocene megafauna present in the region during the Middle Palaeolithic, including mammoth (*Mammuthus primigenius*), woolly rhinoceros (*Coelodonta antiquitatis*) and giant deer (*Megaloceros giganteus*). The analysis identifies all terrain cells visible from the observer point under standard line-of-sight conditions, without atmospheric correction. Three cross-sections were constructed across the Zám Stream valley at 1 km intervals to quantify slope gradients relevant to large game movement and hunting feasibility.

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RESEARCH ARTICLE

Some lithic artefacts from Mexico in the America–Collection of the Museum of Ethnography in Budapest

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Abstract. The America–Collection of the Museum of Ethnography in Budapest houses a small archaeological collection, donated originally to the Hungarian National Museum by Ede Szenger. Besides various ceramic objects, the collection contains some lithic artefacts, mostly bifacially manufactured projectile points. The exact origin of the lithic artefacts is unknown, but indirect evidence suggests that they come from the southeastern part of Tamaulipas State, Northeastern Mexico). This paper describes the lithic artefacts that can be analysed satisfactorily based on the typology lists available to the author.

Keywords: Mesoamerica, Mexico, Tamaulipas State, Huastec culture, projectile points

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1. Introduction

Ede Szenger (1833–1904), a field surgeon in Emperor Maximilian's army, was one of the few Hungarians who had participated in the Mexican campaign (Bánó 1906, p. 169). Szenger worked as the head surgeon of the Austrian military hospital in Pueblo until the emperor's death, which he witnessed. He settled in San Luis Potosí, where he established his medical practice. During his ten years in Mexico, he travelled extensively throughout the country, publishing a book about his travels after he returned to Hungary (Szenger, 1877). After his return to Hungary, Szenger donated his ethnographic and archaeological collection of 70 objects to the museum in 1875 and 1899. Almost all items in the collection originated from Mexico. He appended an inventory list to his 1875 donation, which contained a short description of each object with its size and provenance, titled "Inventory of the Mexican antiquities brought from Mexico and donated to the Hungarian National Museum by Dr. Ede Szenger" (NMI 1/1875). Aside from the entry in the Accessions Register, only a letter of gratitude from Vilibald Semayer has survived about the 1899 donation (NMI 93/899). This list reveals that most of the objects came from San Luis Potosí State (Los Pinos, Rioverde), where he was active as a physician, from neighbouring northern Veracruz State (Tanguian [sic!], Tanquián to southwest of Tampico) and from the Mexico City area (Teotihuacan, Popocatepetl area) (Gyarmati 2008). Concerning the biography of Ede Szenger, see also, Bodó (2007), Szállási (2008), Szente-Varga (2012), and Venkovits (2014).

The Szenger collection also contains 13 pieces of chipped stone. Although the provenance of the finds is uncertain, this small assemblage of artefacts includes some interesting projectile points, which justify a brief description of the finds. Basic artefact dimensions were measured with the "box method" (Debénath & Dibble, 1994, p. 19). In the typological study, the identification of the individual finds was based on numerous literature (García Cook, 1967; MacNeish, 1958;

Parry 2002; Suhm & Krieger, 1954; Suhm, & Jelks, 1962; Tolstoy, 1971). Since the author's earlier article (Péntek, 2024) discussed several technological issues concerning the production of lithic artefacts in Central America, we will not discuss them here. The inventory numbers (inv. no.) of the artefacts are in brackets. In Fig. 1, settlements, some archaeological sites mentioned in the text, and the Huasteca Region in Northeastern Mexico can be seen.

2. Description of the collection

(2024.24.1). Proximal fragment of a parallel-edged prismatic blade. On the upper face, there are two guiding arrises, lines formed by the meeting of two removal negatives. The cross-section is sub-triangular to trapezoidal. The distal end is broken due to some non-anthropogenic force. Its talon (the remnant of the striking surface) is smooth, "bird wing" shaped. The entire lower face shows concentric shock wave ripples. The upper face shows traces of abrasion to strengthen the core rim, removing overhangs or destructive projections. There are intensive use-wear traces along both lateral edges. Dimensions are length (80.3) × 20.3 × 4.5 mm and the weight is 8.9 g. The raw material is black, opaque obsidian. (Fig. 2.1)

(2024.24.2). Distal fragment of a parallel-edged prismatic blade. On the upper face, two guiding arrises are visible. The cross-section is trapezoidal. The presumed proximal end is accidentally broken, indicated by a tongue-shaped breakage (lower position). The distal end is inclined from left to right, truncated in an oblique line. There is use-related retouch along both lateral edges. Dimensions are (66.9) × 18.1 × 4.1 mm. Weight is 6.8 g. The raw material is black obsidian, translucent on the edges. (Fig. 2.2)

Based on the generally accepted definition, the prismatic blade is a long, narrow, specialised blade, made mostly from polyhedral cores through pressure flaking or direct percussion. Prismatic blades very often have trapezoidal cross-section, sometimes very close in appearance to an isosceles trapezoid. However, they may have a triangular cross-section as well. Concerning blade production strategies in Mexico, there is a lot of literature available (see, for example, Crabtree, 1968; 1972; Tolstoy, 1971; Clark, 1982; Clark & Bryant, 1997; Parry, 1994; 2002; Darras, 2008; 2012). It is neither possible nor necessary to discuss these two artefacts in more detail here, since neither the age of the finds nor their cultural affiliation can be concluded.

(2024.24.3). Proximal fragment of a small-sized, irregularly shaped, unretouched flake. Its butt is punctiform. Dimensions are (19.7) × 15.5 × 3.7 mm. Weight is 1.0 g. The raw material is black obsidian, translucent on the edges. (Fig. 2.3)

(2024.24.4). Bifacially manufactured spear point; slightly asymmetrical to the longitudinal axis, that is, the debitage axis is different from the morphological axis. The cross-section is biconvex and triangular in plan view. The lateral edges are approximately straight and slightly convex. The barb on one side is damaged or shorter due to a knapping error. Dimensions are 53.4 × 32.6 × 8.8 mm. Weight is 9.8 g. The raw material is yellowish white "chert", cryptocrystalline or polycrystalline quartz, usually formed as nodules in limestone. The entire surface is shiny; this may be due to the properties of the raw material, taphonomy (geochemistry, soil conditions) or thermal effects. (Fig. 2.4)

The general type of the projectile point is "corner-notched with expanding stem, and barbed". The closest morphological analogies in Garcia Cook's typology are the Tecolote I points (1967, pp. 66–67, Lam. XII, 7–8). The measurement data for this type is 5.3 × 3.7 × 0.8 cm. In Tolstoy's typology (1971, p. 281, fig. 3, j) it is Lange point with broad flaring stem and barbs. According to the description of Suhm & Krieger (1954, p. 436, Plate 97; see, also, Suhm & Jelks 1962, pp. 203–204, Plate 102), the Lange points have a great morphological variety. Large triangular blades, the edges can be straight to convex, occasionally concave or recurved, and the shoulders are prominent and often well barbed. Stem edges expand, often straight, and the base is almost always straight but may be slightly concave or convex. The dimensions vary in a rather wide range, the total length is about 5 to 8.5 cm, and the maximum width across shoulders is 2.7 to 4 cm. Stems are 1.7 to 2.5 cm wide at the base. The given estimated age is 4,000 BC to 1,000 AD. The authors mentioned the resemblance to the Castroville type of points.

(2024.24.5). Bifacially manufactured flat arrowhead. In plan view, it has a regular triangular shape, symmetrical to the longitudinal axis, with a biconvex cross-section. The tip is broken in a straight line. The lateral edges are straight.

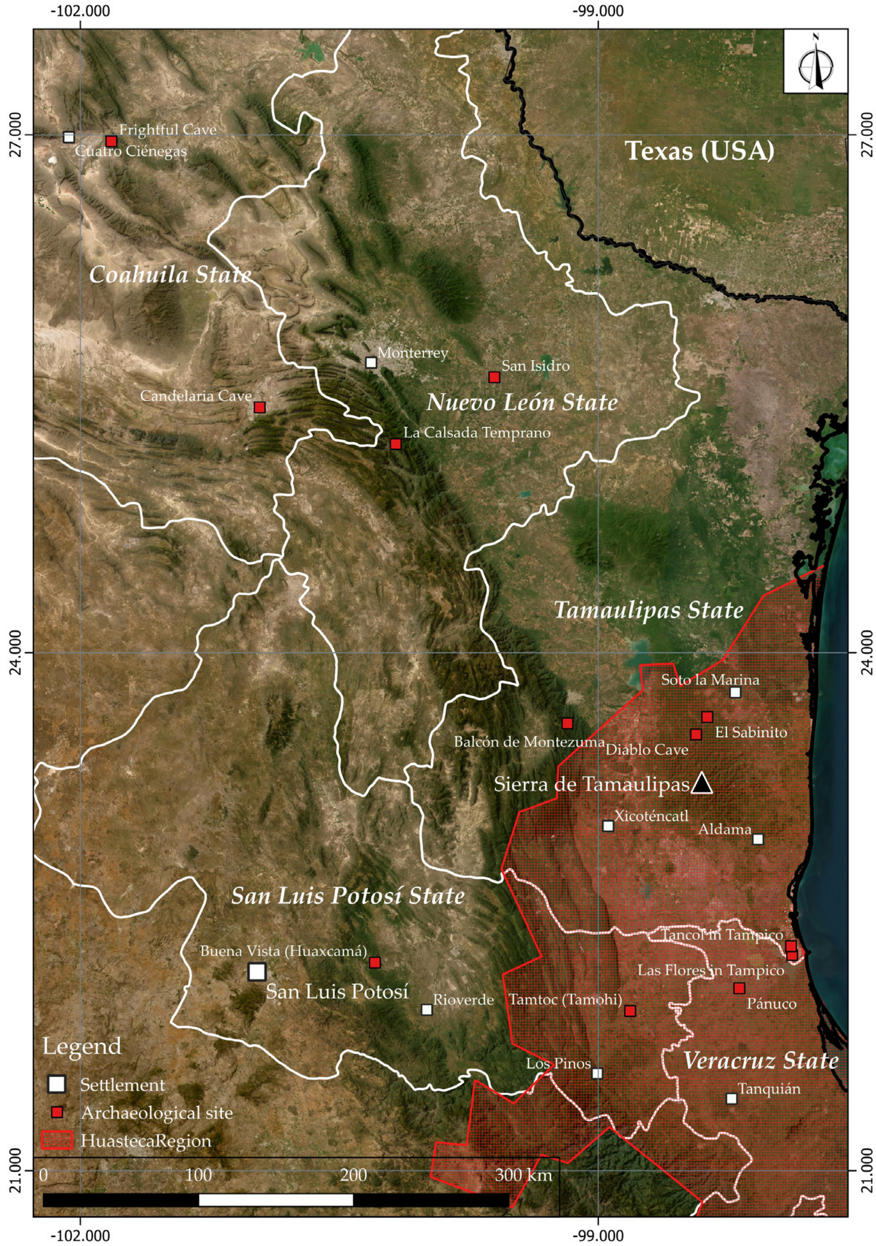

Fig. 1. Settlements, some archaeological sites, and the Huasteca Region in Northeastern Mexico (Map courtesy of World Imagery).

The butt and bulb are not visible, they have been removed with fine removals. The length of the slightly converging stem is 6.7 mm, and the shoulders are straight. Dimensions are [33.5] × 20.1 × 5.9 mm. Weight is 1.0 g. The raw material is a whitish-grey, slightly coarse-textured "chert". (Fig. 2.5)

The general type of the projectile point is "with contracting stem". According to Suhm & Krieger (1954, pp. 438–439, Plate 98; see, also, Suhm & Jelks 1962, pp. 205–206, Plate 103), the triangular blade of this Langtry point may have straight to concave or recurved edges. Shoulders are prominent to widely outflaring, often uneven. The barbs may sweep widely outward, and the stems are long, generally contracting. The dimensions vary in a rather wide range, the total length is about 4 to 7 cm and the maximum width across the shoulders is 2.2 to 4 cm. Stems are 0.6 to 1.6 cm wide at the base. The given estimated age is uncertain, an unknown time before Christ to 700 or 800 AD. Garcia Cook (1967, p. 61, Lam. IX, 7–8) classified the Langtry point in the class of "*Familia IV, Muescas que eliminan esquinas*" (Notches that eliminate corners), without giving any details.

(2024.24.6). Bifacially manufactured arrowhead. It is regular in plan view, symmetrical to the longitudinal axis. The lateral edges are slightly convex and it has a flat biconvex cross-section. The tip of the arrowhead is broken. The right side of the concave base is broken. Dimensions are [35.5] × 21.0 × 3.9 mm. Weight is 2.3 g. The raw material is yellowish-white "chert". (Fig. 3.1)

The general point type is "corner-notched with a concave base and expanding stem". From the morphological point of view, the arrowhead is very similar to the Marcos points but significantly smaller. The Marcos points (Suhm & Krieger 1954, pp. 442–443, Plate 100; Suhm & Jelks 1962, pp. 209–210, Plate 105) have generally large, broad triangular blades with edges straight, slightly convex, or even gently recurved. They are always barbed, deep notches are cut into corners at about a 45-degree angle; it always makes the stem strongly expanding. The bases are straight to convex, rarely slightly concave. The total length is 4.5 to 9–10 cm, and the maximum width across barbs is about 3 to 4.5 cm. The stem base is about 2 to 3 cm, and rather consistently about 1 cm long. The estimated age is possibly 2,000 BC to 1,000 AD.

According to Suhm & Krieger, Marcos point bears resemblances to Ensor points (Suhm & Krieger 1954, pp. 422–423, Plate 90; Suhm & Jelks 1962, pp. 189–190, Plate 95), but is distinguished by deeper notches and narrower stem neck in proportion to blade width, and is generally broader with much longer barbs. There are resemblances to Castroville points (Suhm & Krieger, 1954, pp. 408–409, Plate 83; Suhm & Jelks 1962, pp. 173–174, Plate 87), but stems not as broad across the neck and expand more sharply, notches do not cut inward from the base.

Garcia Cook (1967, pp. 62–63, Lam. X. 3–4) listed similar points in the class of "*Familia V, Muescas angulares*" (Angular notches) as Marcos-Tepeapulco points, a local variant of Marcos points. This variant has a wider base and the retouching is finer elaborated.

Tolstoy (1971, p. 278, fig. 2) represented a Marcos point with a convex base. He also referenced a similar point revealed during the excavation led by George C. Vaillant at Ticoman (Vaillant, 1931, Plate LXXXVI, 3rd row, 9, 10). The site of Ticoman like the nearby sites of El Arbolillo, Zacatengo, and Tlatilco in the central valley of Mexico, belongs to the so-called "Formative Period", from about 1,500 BC to the beginning of the Christian era.

(2024.24.7). Arrowhead made on a microblade (narrow blade) with one guiding arris and a triangular cross-section. Its cross-section is parallelogram-shaped. The lateral edges are straight, and bifacially retouched, and the tip of the arrowhead is damaged. Both lateral edges have two narrow, shallow notches. Dimensions are [29.9] × 15.7 × 5.1 mm. Weight is 1.9 g. The raw material is greyish "chert". (Fig. 3.2)

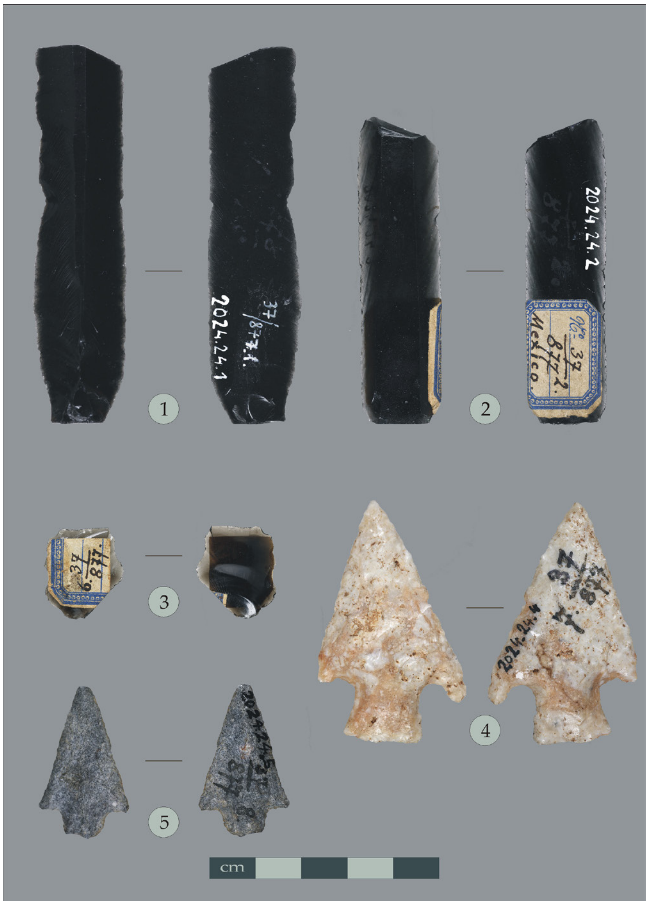

Fig. 2. Selected artefacts of the Szenger collection. Photos: Attila Péntek

The general type of the arrowhead is "corner-notched with expanding stem and convex base". It can be identified either as a San Antonio Multiple Notch point or rather as a Duran point. Concerning the first alternative (https://www.projectilepoints.net/Points/San%20Antonio%20Multiple%20Notch.html), this point has an approximate date of 1,800 to 650 BP. Its cultural period is "Transitional Archaic to Classic". This is a small to medium triangular to ovoid expanding stem point with a thin cross-section. The blade is excurvate and has two to three notches on both edges above the base. The shoulders are asymmetrical and commonly at an upward angle. The stem is expanding with a convex base. This point is made from an ovoid preform and has a random flaking pattern. Size measurements are: length is 25 to 40 mm (average 32 mm), blade width is 16 to 24 mm (average 20 mm), and thickness is 3 to 5 mm (average 4 mm).

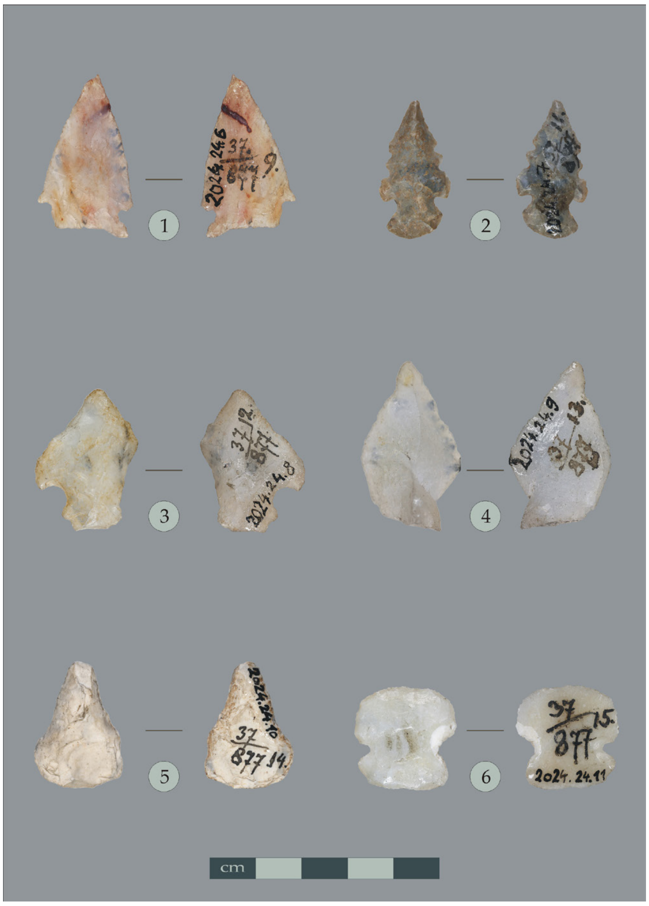

Fig. 3. Selected artefacts of the Szenger collection. Photos: Attila Péntek

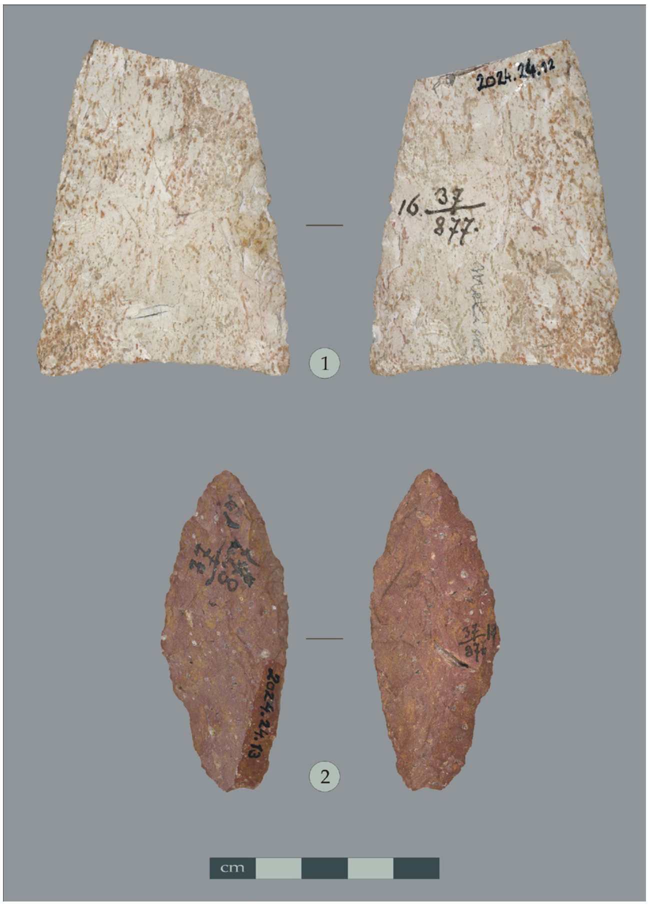

Fig. 4. Selected artefacts of the Szenger collection. Photos: Attila Péntek

Spence (1971) records these arrowheads to the west of Zacatecas and Durango, where the three variants of Lazalde (1992) can be recognised. The San Antonio Phase within the Chalchihuites culture is dated between 850 and 1,000 AD).

As regards the Duran dart points, defined by Taylor (1966) for the Cuatro Ciénegas region of Coahuila State, these points are characterized by rounded to expanding stems and by one or two notches on the lateral edges. Their distribution is exclusive to the north/northeast of Mexico (Coahuila, Zacatecas, Durango, San Luis Potosí) since they are not reported for the American Southeast or Texas. They are associated with the "Middle Archaic Period" between 2,500 BC to 1,200 AD (Lazalde, 1992; Turner *et al.*, 2011; Gallaga Murrieta, 2018, p. 54). In his doctoral thesis, Ortiz Pérez (2018), under the name of the "Duran" morphological group discussed in detail the multi-notched arrowheads. Four morphological classes with several subclasses were distinguished, and their geographical distribution and cultural association were also given.

(2024.24.8). Roughly, bifacially manufactured arrowhead. Thick, and symmetrical to the longitudinal axis, it has an irregularly triangular shape in plan view. The left lateral edge is irregularly lined, and the end of the barb is rounded. The right side is fragmentary. It has no butt or bulb, the base is straight-lined, and both corners of the base are oblique. Dimensions are 30.9 × [20.5] × 7.1 mm. Weight 4.0 g. The raw material is off-white "chert". (Fig. 3.3)

The general type of the arrowhead is "corner-notched with extracting stem". Its closest analogy is the Ensor point. According to Suhm & Krieger (1954, pp. 422–423, Plate 90; Suhm & Jelks 1962, pp. 189–190, Plate 95), the blade is triangular and varies considerably in length and width. The edges may be slightly concave. The shoulders vary from slight to pronounced, and barbs, if present are short. Stems are broad across the neck. The total length is about 3 to 7 cm (the average is perhaps 5 cm), and the maximum width across the base or shoulders is 2 to 3 cm. The stem is seldom more than 1 cm long. See, also, Tolstoy (1971, p. 278, fig. 2, m).

(2024.24.9). An irregularly shaped, thick flake, likely an arrowhead, with a guiding arris and a sub-triangular cross-section. The distal end terminates in a blunt tip; the converging lateral edges are approximately straight, and retouched. Near the distal end of the left edge, there is a small inverse (struck from the upper face) notch. Dimensions are [37.9] × 22.1 × 10.3 mm. Weight is 5.7 g. The raw material is white "chert", translucent at the edges. The expanding stem was either originally so unusually one-sided or damaged. In the latter case, the recycled arrowhead may have been used as a borer. (Fig. 3.4)

The assumed arrowhead was probably the so-called Ellis point (Suhm & Krieger, 1954, pp. 420–421, Plate 89; Suhm & Jelks, 1962, pp. 187–188, Plate 94; Garcia Cook, 1967, pp. 62–63, Lam. X. 19–20; Tolstoy, 1971, p. 278, fig. 2). This point is a short triangular blade usually with straight to concave lateral edges. Shoulders are prominent or well-barbed. The stem expands towards the base but is not as broad as the shoulders, and the base is straight to convex. The total length is 3 to 5 cm, and the maximum width across the shoulders is about 2 to 3 cm. The estimated age is possibly 1,000 BC or earlier to 500 or 1,000 AD.

(2024.24.10). In plan view, it is a sub-triangular arrowhead with rounded corners and irregular lateral edges. The tip is slightly damaged, and the base is convex. The lateral edges and the distal end near the tip are bifacially retouched. The proximal ends of the upper and lower faces are only thinned. Dimensions are 27.5 × 19.2 × 5.9 mm. Weight is 2.5 g. The raw material is white, opaque "chert". (Fig. 3.5)

The arrowhead is atypical, its closest morphological analogy is perhaps the Loma Small point (https://www.projectilepoints.net/Points/Loma%20Small.html). This is a small triangular point with a thin elliptical cross-section. The blade is broad and commonly excurvate with a base that ranges from straight to convex and square to rounded basal corners. One blade may have a faint or suggestion of a notch. This point has a random flaking pattern. Size measurements based on small sample size are, length is 27 to 36 mm (average 30 mm), blade width is 16 to 23 mm (average 18 mm), and thickness is 4 to 9 mm (average 7 mm). The date is 1,800–1,400 BP; the Cultural period is "Transitional Archaic to Preclassic". There is a great cluster of similar points.

(2024.24.11). It appears to have originally been a "side-notched convex base" type arrowhead, with slightly convex side edges. If this were the case, then after the distal end and tip were damaged, it was converted into a double end-scraper. During the reworking, an approximately straight distal scraper edge was formed, and another scraper edge was formed on the convex base. Both scraper edges are retouched semi-abrupt, there are no signs of renewal. The patina is asymmetrical, the entire surface of the upper face is shiny, and on the lower face, only the "use shine/polish" created during the use of the scraper edge on the base is visible. Dimensions are 23.3 × 22.2 × 4.1 mm. Weight is 2.7 g. The raw material is whitish "chert" or "milky opalite". (Fig. 3.6)

However, the interpretation of the object is different from the above. According to Aveleyra *et al.* (1956, pp. 75–77), this object is an extremely specialised tool. Since it was also found inside the La Candelaria cave, it is certainly part of the Candelaria industry itself. These end-scrapers offer a very clear and perfect case of typological evolution, starting from the simple terminal end-scrapers and gradually tending to be stemmed. There are a certain number of notched and stemmed scrapers in various archaeological sites in the United States, but these are invariably made in a very different way to those from Las Delicias in Chihuahua State. They are essentially different since they are stemmed projectile points whose upper half of the blade was broken off. The basal, stemmed portion was preserved by reworking the fracture plane to use the fragment as an end-scraper. This type of end-scraper is especially common in the lithics of the Teotihuacan culture. Gamio illustrates three obsidian specimens belonging to this type, which he calls "spoon-shaped scrapers with a blade", used for "scraping" maguey ("*Piezas de obsidiana en forma de cuchara con filo, que indudalamente se usaron para la «raspa» del maguey*"; Gamio, 1922, Vol. I, p. 216, Lám. 120, d). Linné found another identical piece made of obsidian among the offerings of a Teotihuacan burial explored in Tlamimilolpa (Linné, 1942, pp. 134–135, Figs. 263-271; above, centre). He called the object "a ladle-shaped scraper, possibly used in tapping maguey plants for pulque."

(2024.24.12). Proximal fragment of a large dart- or spearhead, biconvex in cross-section. The distal end is broken obliquely long ago, the fracture surface is relatively smooth. Its patination is the same as of the entire surface. The probable cause of the fracture could have been a knapping accident. Both slightly convex lateral edges are bifacially retouched, on both the upper and lower face, there are negatives of some irregular, larger transverse thinning removals. The base is slightly concave, thinned on both faces, likely for hafting purposes. Dimensions are [73.4] × 54.8 × 6.7 mm. Weight is 33.6 g. The reconstructed length could have been between 120 and 125 mm. The raw material is whitish, non-transparent, yellowish-brown spotted "chert". (Fig. 4.1)

The morphological most likely analogy is the Kinney point. According to Suhm & Krieger (1954, p. 434, Plate 96), it is a leaf-shaped blade, the lateral edges are usually convex but in some cases, they are almost straight. The base is always concave. The typical dimensions are 4.5 to 11 cm, maximum width is about 2 to 3.5 cm. As the authors noted, it is quite possible that at least the longest and broadest specimens were knives. The estimated age is 1, 000 or 2,000 BC to 1,000 AD. The Kinney point is widely spread from the central coastal region of Texas, the Rio Pecos region into the Gulf Coast and down to the coastal region of Tamaulipas in Northeast Mexico. The description of the Kinney point in MacNeish (1958, pp. 71–72, fig. 25.12) is somewhat different. The blade has parallel (or slightly convex) edges for half their length and then taper with convex edges to a point. On their surfaces, there are wide diagonal or straight removals through pressure flaking (not ripple flaking). Points range from 56 to 93 mm long (averaging 73 mm), have a maximum width at their base of 30 to 40 mm, averaging 34 mm, and the maximal thickness is about 8 mm.

On the webpage LITHICS-Net, the Center of the Web for Point Typology Information on North American Aborigine Projectile Points, Arrowheads & Lithics, based on recent data, there is a considerably wider definition of the Kinney point (http://www.lithicsnet.com/kinney.htm). Based on this definition, the Kinney blade is a medium to large-sized, thin, lanceolate, well-made knife blade with incurvate, excurvate or straight blade edges and a concave basal edge. The Kinney has a definite triangular outline and the blade can range from 50 mm to 178 mm in length. The represented specimen measures 85 mm in length, 37 mm wide at the base and is only 7 mm at its thickest point (18 mm from the concavity of the base) with the blade being a rather uniform 6 mm in thickness. The Kinney is found in Texas from the Pecos River eastward to the Caddoan area, it is most common from the Gulf Coast northward into the central Texas area. The associated dates are 3,000–1,000 BP., "Late Archaic" to "Late Woodland" cultural periods.

The Projectile Point Identification Guide webpage (http://www.projectilepoints.net/Points/Kinney.html) defines the Kinney point as follows, "This is a medium to large (typically 2 to 3 inches) triangular blade with a flattened cross-section. The blade is primarily excurvate, but may vary to almost straight and is never beveled. Re-sharpened examples may have an incurvate blade. The base is concave and rarely has hafting region grinding and/or smoothing. This point has a random flaking pattern." Size measurements are: length is 45 to 110 mm, width is 20 to 35 mm. This point is primarily found from the central coastal region of Texas into the Gulf Coast into the Pecos region and down to the coastal region of Tamaulipas. The webpage mentions this point as similar to the Tortugas point (also known as Baird Beveled Blade and Taylor Thinned Blade; see, Kelly, 1947). The given cultural period is "Transitional Archaic", and the date is 3,000–2,000 BP.

Some researchers suggest that some of these types were not just points but knives. These stemless points are triangular to elongated in shape, with curved and parallel edges with a concave base and in some cases a small groove. Their distribution is centred in the southwestern region of Texas and possibly within northeastern Mexico. Their temporality is located in the Middle Archaic (2,500–1,200 BC) (Gallaga Murrieta, 2018, p. 54). An extensive study of Kinney has been carried out by Goode (2002. He separated the specimens from the Anthon sie (41UV60; Nueces River, southern Uvalde County, Texas) into four forms, suggesting some were dart points and others were used as knives (Turner *et al.* 2011, p. 121).

(2024.24.13). Its longitudinal axis is symmetrical, and in plan view, it is a spindle-shaped dart- or spearhead with a biconvex cross-section. Both faces have thinning removals, the convex lateral edges are bifacially retouched. The tip is slightly obtuse. The proximal end, the narrow base is slightly concave and bifacially worked. Presumably, it was made on a suitable raw material piece and not on a debitage product (flake, thick blade). Probably due to a knapping accident, the proximal end on one side is slightly "shouldered" in shape, and the base is narrowed. Dimensions are 69 × 27.5 × 10.5 mm. Weight is 17.9 g. The raw material is brownish rock with quartz crystals, probably of volcanic origin. (Fig. 4.2)

The general type of the arrowhead is Lerma point, similar to Refugio point (Suhm & Krieger, 1954, pp. 440–441, Plate 99; MacNeish, 1958, pp. 62–63, Fig. 23.22–27, Lerma Double-pointed; Suhm & Jelks, 1962, pp. 207–208, Plate 104; Garcia Cook, 1967, p. 56, Lam. VII. 1–2 Lermoide, Lam. VII. 3–4 Refugio; Tolstoy, 1971, p. 277, fig. 2,e Refugio fig. 2,i Lerma; García Moll, 1973, p. 34, Lám. 12 Refugio; Cambron & Hulse, 1975, p. 80, Lerma Rounded Base).

On the webpage LITHICS-Net (http://www.lithicsnet.com/lermaroundedbase.htm), the description of the Lerma Rounded Base projectile point is the following: "its a medium to large sized long, ovoid, likely to be leaf-shaped form, having excurvate sides and a rounded basal end. Some points have small serrations on the blade edges. The stem end contracts to a rounded shape. The stem is usually lightly ground."

The longer and broader examples of the type are thought to have doubled as knives or spear points. The type was manufactured by applying Transitional Palaeolithic flaking technique, irregular pressure and percussion flaking. The average example measured 109 mm long and 28 mm wide as the bade base junction which is the widest dimension and averages 9 mm thick. The associated dates are 10,000–5,000 B.P. – "Transitional Paleo" to "Early Archaic" period.

The Projectile Point Identification Guide webpage (http://www.projectilepoints.net/Points/Lerma.html) gives the following definition for the Lerma Bi-Point or Lerma Round Base projectile point. The Lerma point is usually a long, slender, double-pointed leaf-shaped blade; one end may be somewhat rounded. For the most part, their thickness and steep edges make them unsuitable for knives and their symmetry suggests the balance needed for projectile points. Typical dimensions are: length is 5.5 to 10 cm, maximum width is 2 to 3 cm. The distribution is from the western part of Central Texas to the Pecos River mouth, southward to the central coast and Southwest Texas, and south of Rio Grande to southern Tamaulipas in Northeast Mexico. According to Suhm & Krieger (1954, p. 440), the Lerma points possibly appeared earliest in southern Tamaulipas, several thousand years BC.

3. Discussion

Apart from the two obsidian blade fragments, the small assemblage is extremely heterogeneous. It looks like a small, deliberately assembled selection. Since no precise information is available on the provenance of the artefacts, it seems very likely that Szenger may have received the finds either as a gift or as a fee as a practising physician. Regarding the possible provenance, perhaps a starting point is that according to János Gyarmati (2008) "The most outstanding pieces in his collection are the painted and figural vessels made in the Huasteca style from San Luis Potosí." The pre-Columbian Huastec civilization occupied a vast territory on the Gulf Coast of Mexico, including the northern part of Veracruz State, the southeastern area of San Luis Potosí State and the southern portion of Tamaulipas State. The migration history of the Huastecs is rather complex, they arrived in the Huasteca Region probably between 1,500 BC and 900 BC (see, for, example, Kaufmann, 1976). There is linguistic evidence that the language of the Huastecs descended from Proto-Mayan and the precursor of the language diverged from the Proto-Mayan language between 2200 and 1200 BC (see, for, example, Dahlin *et al.*, 1987). Numerous writers (see, for example, Krieger, 1945; Du Solier *et al.*, 1947) have supported the validity of the assumption that there were cultural relations between the people of the U.S. Southeast and the more complex cultures of Mexico. This assumption also applies to the Huastec civilization, to its material culture. It is therefore no coincidence that MacNeish (1958, p. 25) used the terminology and typology of Suhm & Krieger (1954) when analyzing a large collection of projectile points from the Sierra de Tamaulipas mountain range in southern Tamaulipas state. He classified altogether 807 projectile points found in the Sierra de Tamaulipas into eighteen types that have significance in space and time. However, he also identified twenty projectile points that did not fit any of the defined categories from Tamaulipas. He called these aberrant points, and many of them may have been traded into the area from other regions.

The Kinney point (inv. no. 2024.24.12) of the Szenger collection was regarded by MacNeish (1958, p. 59) also as an aberrant point since the six specimens found in the Sierra de Tamaulipas occurred only in the Almagre cave. MacNeish was able to radiocarbon date the Almagre Phase from a shell pendant roughly 2,200 to 1,800 BC (cf. Mahoney *et al.*, 2002, p. 76, 4,200–3,500 BP). In conclusion, it can be stated that the object in the Szenger collection is a rather large, unusually wide specimen.

Concerning the Lerma point (inv. no. 2024.24.13), referring to Creswell (1956, pp. 413–414, Type 11A), MacNeish (1958, p. 58) wrote that the earliest type projectile point, having a general laurel-leaf shape, was widespread in pre-ceramic horizons in America. The data in Tamaulipas, in the Valley of Mexico (Cruxent & Rouse, 1956), and Coahuila suggest that Lerma Double-pointed is a very early type that endured into later horizons in some parts of North America. MacNeish also raised the hypothetical question of whether the similarly shaped points and their accompanying complexes from the earliest horizons of South America, namely, the El Jobo Complex of Venezuela (Aveleyra, 1953), the Shell Fishhook culture in northern Chile (Bird, 1943), and the Huancayo Complex of Peru (Tschopik, 1946) were related to those in Tamaulipas.

As far as Tamaulipas was concerned, this Lerma Phase projectile point type could not have been connected with those from later horizons. The Lerma Phase for Tamaulipas was dated from the Diablo Cave (Cañón del Diablo) to 9,270±500 BP (Crane & Griffin, 1958, p. 1103, M-499). According to Epstein *et al.* (1980, p. 87) MacNeish's date for the Lerma Phase at Diablo Cave (7,320±500 BC) probably gives the earliest date. Confirmation of this placement comes from the La Calsada rock shelter near Moterrey in the Pilón River valley (Nuevo León State, Sierra Madre Oriental), where the three earliest dates of the unit containing Lerma points being 7,360±160 BC, 7,320±150 BC, and 6,660±100 BC. These dates are in line with the earliest dates of 7,585±550 BC and 7,345±400 BC from Frightful Cave (Cueva Espantosa) in Coahuila (Crane & Griffin, 1958, p. 1104; Taylor, 1966). Epstein *et al.* (1980, p. 68, Tab. 4), gave an approximate date for the Lerma Phase in Sierra de Tamaulipas as 8,000–7,000 BC. Acosta *et al.*, 2016, Tab.2), after Epstein (1969), mentioned the San Isidro site in Tamaulipas where Lerma points were also present.

Ardelean (2013, pp. 100–103) discussed the Lerma point among the controversial types, which pose a series of intriguing problems related to either the artefacts themselves or their inter-association in the archaeological record. Referring to the given date for the Lerma point of White (2006, p. 238) of 6,500–1,000 BC, and similar "guessing" chronologies (see, for example, Suhm & Krieger, 1954; Turner & Hester, 1993) he stated that "A lithic type with over 5,000 years of survival and with such a wide variety of shapes and sizes is rather a symptom of confusion than an objective reality and a technological tradition."

Regarding the used raw materials of the Szenger collection, only a few general remarks can be made. According to MacNeish (1958, p. 153), the flint knapped the Lerma people – who were living in nomadic micro-bands – was predominantly not from the local strata of grey chert like the later horizons. The presence of foreign flint may indicate some outside trade contacts. Local chert, either the black or dark grey variety can be found in lenses in the Canyon Diablo, the mottled light grey chert of Canyon Calabaza (MacNeish 1958, p. 154). In later horizons (Laguna, Eslabones, and La Salta Phases; 650 BC to AD 1,000 or 1,000 BC to AD 1,000 (Epstein *et al.*, 1980, p. 68, Table 4)), there is considerable evidence of widespread trade, obsidian, among others, was imported from the South. In the Laguna Phase, the majority of the prismatic blades were made of obsidian, and some of them were struck from cylindrical fluted cores with a striking platform at right angles to the side.

4. Conclusion

As can be seen, the seemingly insignificant small assemblage of artefacts of uncertain origin contains several interesting and problematic objects. As the date of each projectile point type is very relative and in many cases only indicative, the projectile points can be classified within a broad period. Thus at the same time, the collection presents an instructive cross-section of the area around Tamaulipas in northeastern Mexico. The paper is also a brief commemoration of the Hungarian surgeon Ede Szenger, no longer known to many. One can only hope that the

Huastec ceramics in the collection originating from him will also be processed.

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